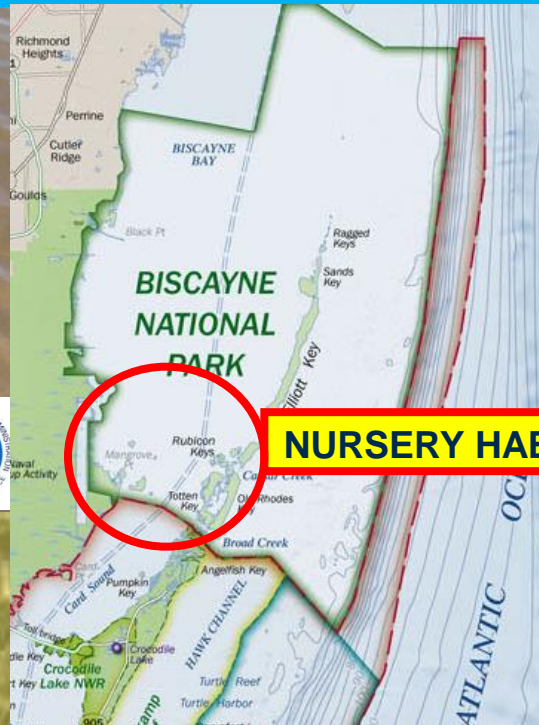


BISCAYNE BAY; HISTORICAL AND FUTURE RESTORED HABITAT OF THE SMALL TOOTHED SAWFISH *Pristis pectinata*

A CASE FOR RESTORATION OF HISTORICAL NURSERY HABITAT, AND CALL FOR ESA DESIGNATION OF PART OF BISCAYNE BAY AS A “CRITICAL NURSERY HABITAT” (CNH) OR A “HABITAT AREA OF PARTICULAR CONCERN” (HACP) LISTING





THESE AGENCIES AND INSTITUTIONS ARE, OR HAVE BEEN, INVOLVED WITH SAWFISH RESEARCH IN FLORIDA



THE FLORIDA NATURAL HISTORY MUSEUM IS NOW HEADING THE INTERNATIONAL SAWFISH

FNHM GLOBAL SAWFISH ENCOUNTER DATABASE :

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishdatabase.html>

NOAA SMALLTOOTH RECOVERY PLAN (2009);

<http://www.nmfs.noaa.gov/pr/pdfs/recovery/smalltoothsawfish.pdf>

NOAA SERTC SMALLTOTH SAWFISH PAGE:

Shelley Norton - Sawfish Coordinator / Phone: (727) 824-5312 / shelley.norton@noaa.gov

http://sero.nmfs.noaa.gov/protected_resources/sawfish/index.html

HOW TO REPORT A SAWFISH SIGHTING:

<http://myfwc.com/research/saltwater/fish/sawfish/contact/>

To report a sawfish sighting:

-E-mail: Sawfish@MyFWC.com

-Telephone: 941-255-7403

please include the date and time of the encounter, the location,
the estimated length of each sawfish, the water depth, and any other relevant details.



The (INTER)NATIONAL SAWFISH ENCOUNTER DATABASE

Maintained at the Florida Museum of Natural History under Dr. George Burgess

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishdatabase.html>

The International Sawfish Encounter Database (ISED) has recently been transferred to the Florida Program for Shark Research (FPSR) at the Florida Museum of Natural History (FLMNH). Formerly housed at Mote Marine Laboratory, the ISED has integrated the Mote database with four other sawfish databases: one from the FLMNH, two from the Florida Fish and Wildlife Conservation Commission, and another database from a private sawfish aficionado. As a result, all existing information regarding U.S. smalltooth sawfish is now held in one place (FLMNH) under the ISED. Therefore, the FPSR will be handling all future sawfish encounter reports.

SAWFISH are “elasmobranchs” related to sharks, guitar fish and rays, all having a cartilaginous skeleton. They can grow to over 18’ and more than 700lbs (FFWCC)

Like many elasmobranchs they are “K selected” and produce few young that are entirely dependent upon shallow estuaries as their nurseries. They are ovoviparous, and no known breeding or nursery sites have been identified.

However > Encounter data have identified river mouths as areas where many people observe both juvenile and adult sawfish.

SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

However – there is more unknown for this species than known.

Unknowns

- > No directed research on smalltooth sawfish feeding habits exists;
- > Very little is known about the specific reproductive biology (litter size/ gestation etc) of the smalltooth sawfish;
- > No data on local (SOFLA) historic range
- No confirmed breeding or nursery sites have been identified to date since directed research began in 1998
- **Current small scale sawfish regulations are based on reproductive nursery definitions for sharks, and in no way are based on sawfish data, because there is no functional sawfish data**

RECENTLY DISCOVERED

Small tooth **sawfish** females have the ability to reproduce parthenogenically;

Fields, Andrew T., Kevin A. Feldheim, Gregg R. Poulakis, and Demian D. Chapman.

"Facultative parthenogenesis in a critically endangered wild vertebrate." Current Biology 25, no. 11 (2015): R446-R447.

SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

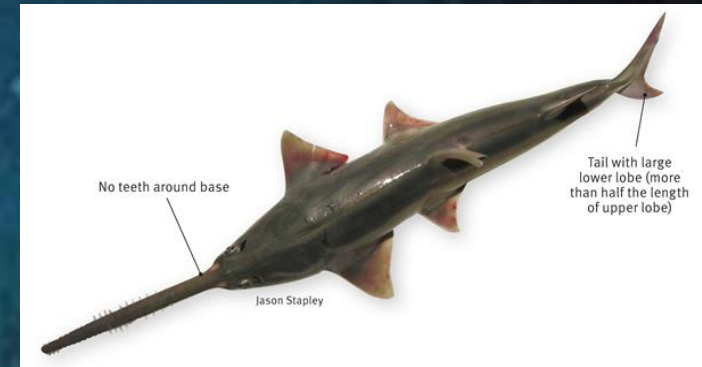
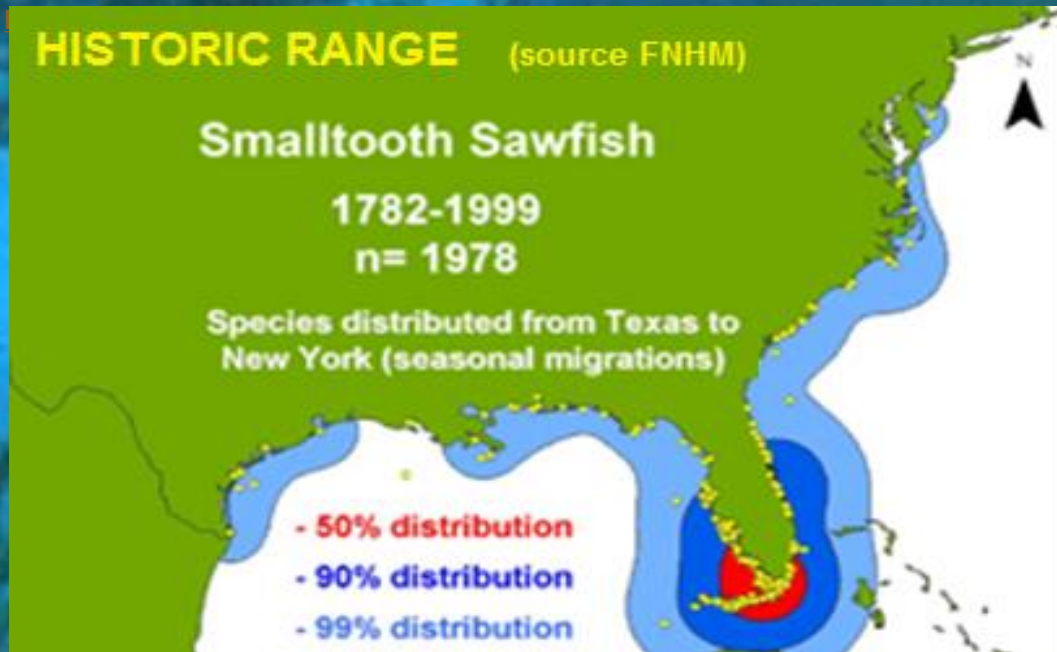
Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

DISTRIBUTION:

P. pectinata are common only in Florida and currently **most common in the Southwestern Everglades.**

Historically, (below) the U.S. population was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to North Carolina.

TEXT SOURCE: NOAA / TABLE AND MAP SOURCE: FNHM



State	# Reports	# Individuals
Unknown	17	17
AL	13	16
CA	1	1
FL	4399	8105
GA	3	3
LA	19	19
MD	1	1
MS	9	9
MS or LA	1	1
NC	15	23
NJ	3	4
NY	1	1
SC	19	19
TX	282	289
VA	3	3

Where have the Sawfish gone??

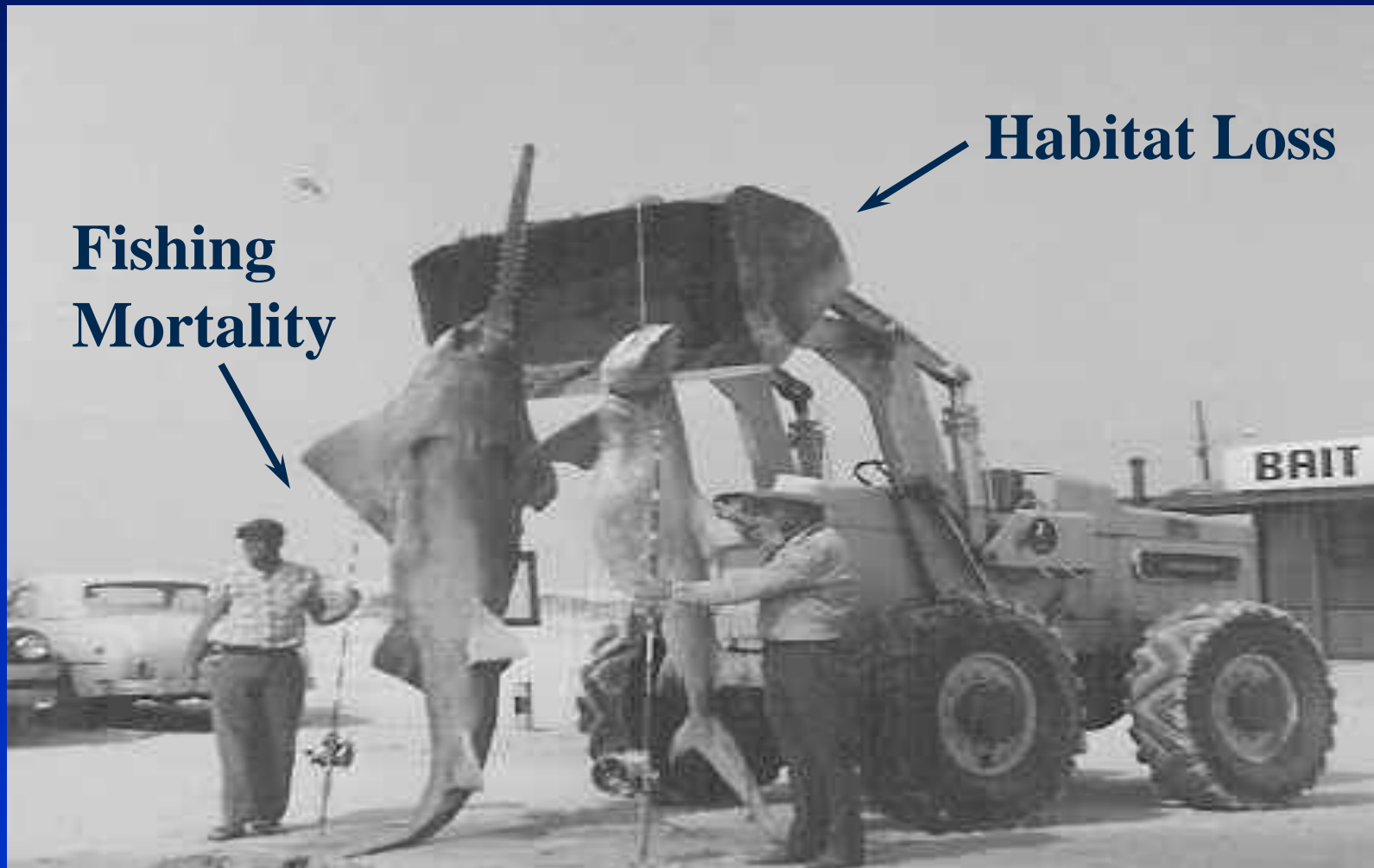


SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

Where have the Sawfish gone??

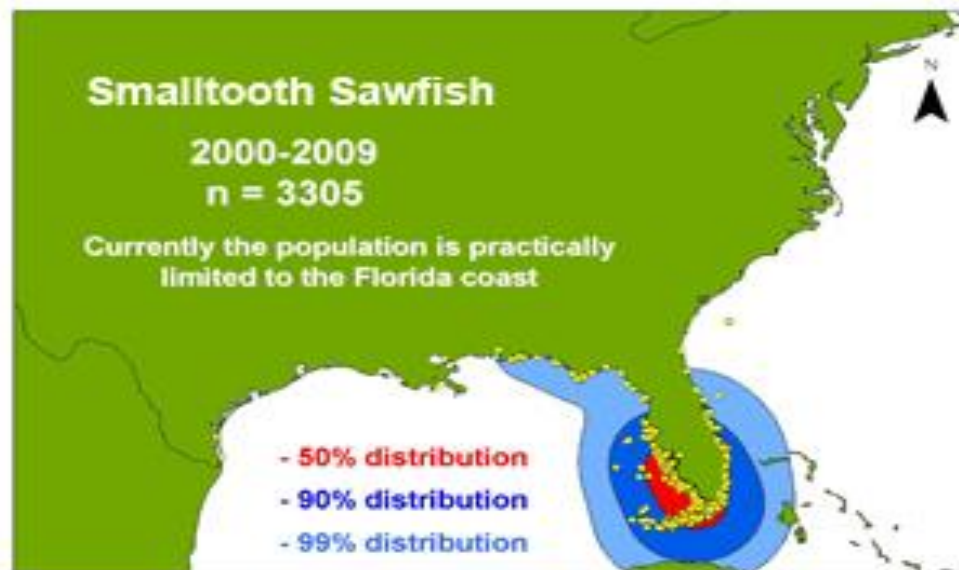
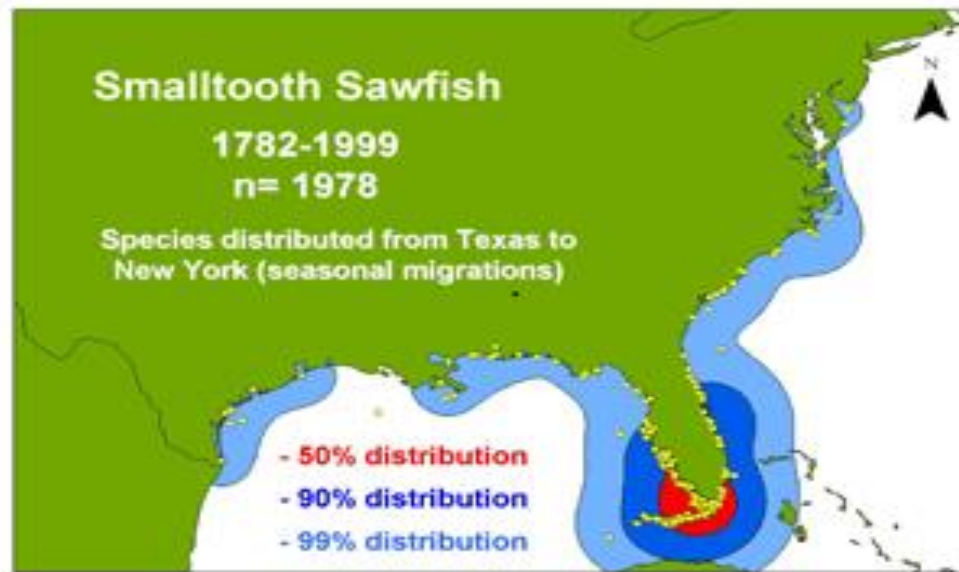


SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

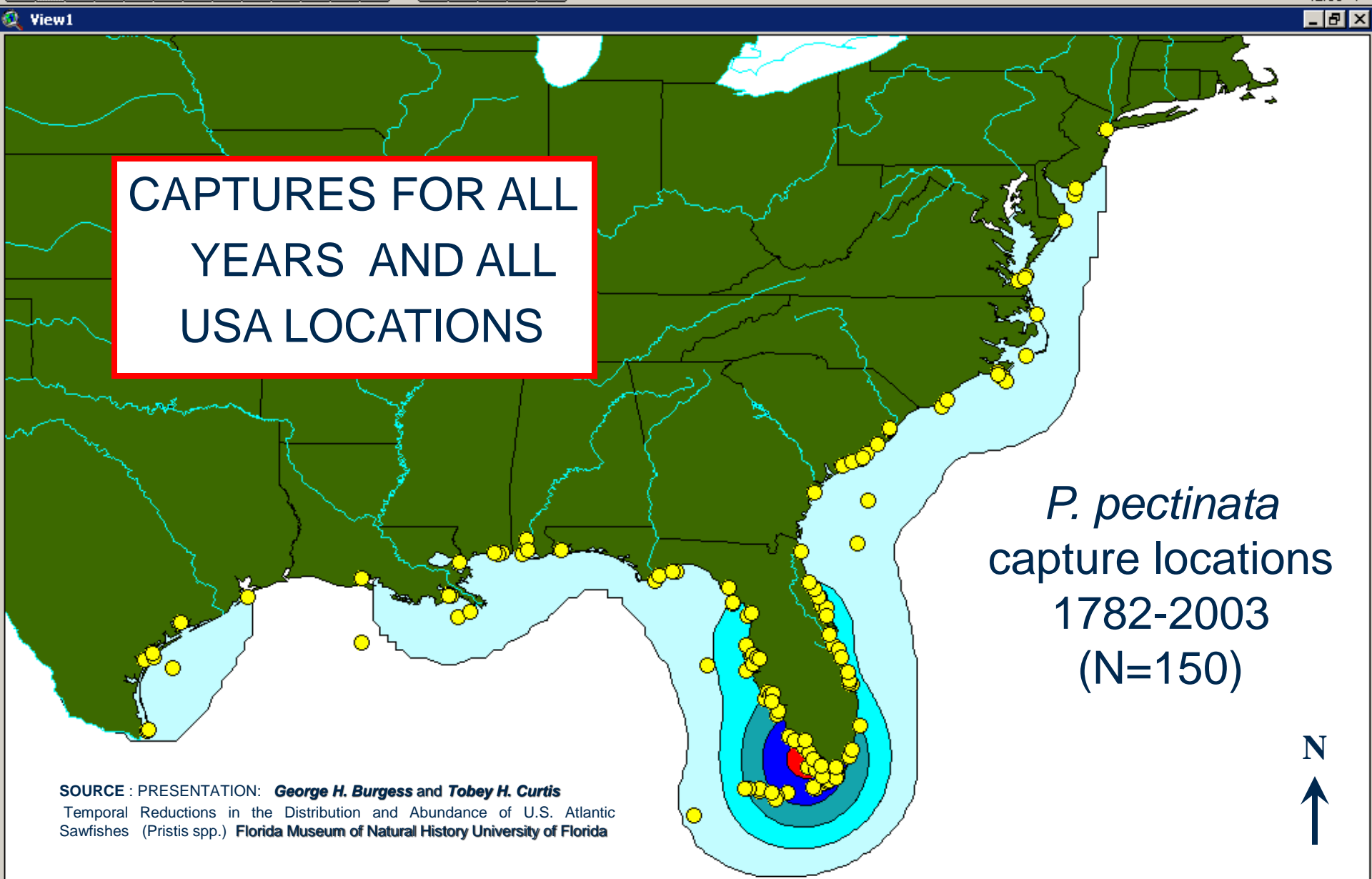
Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

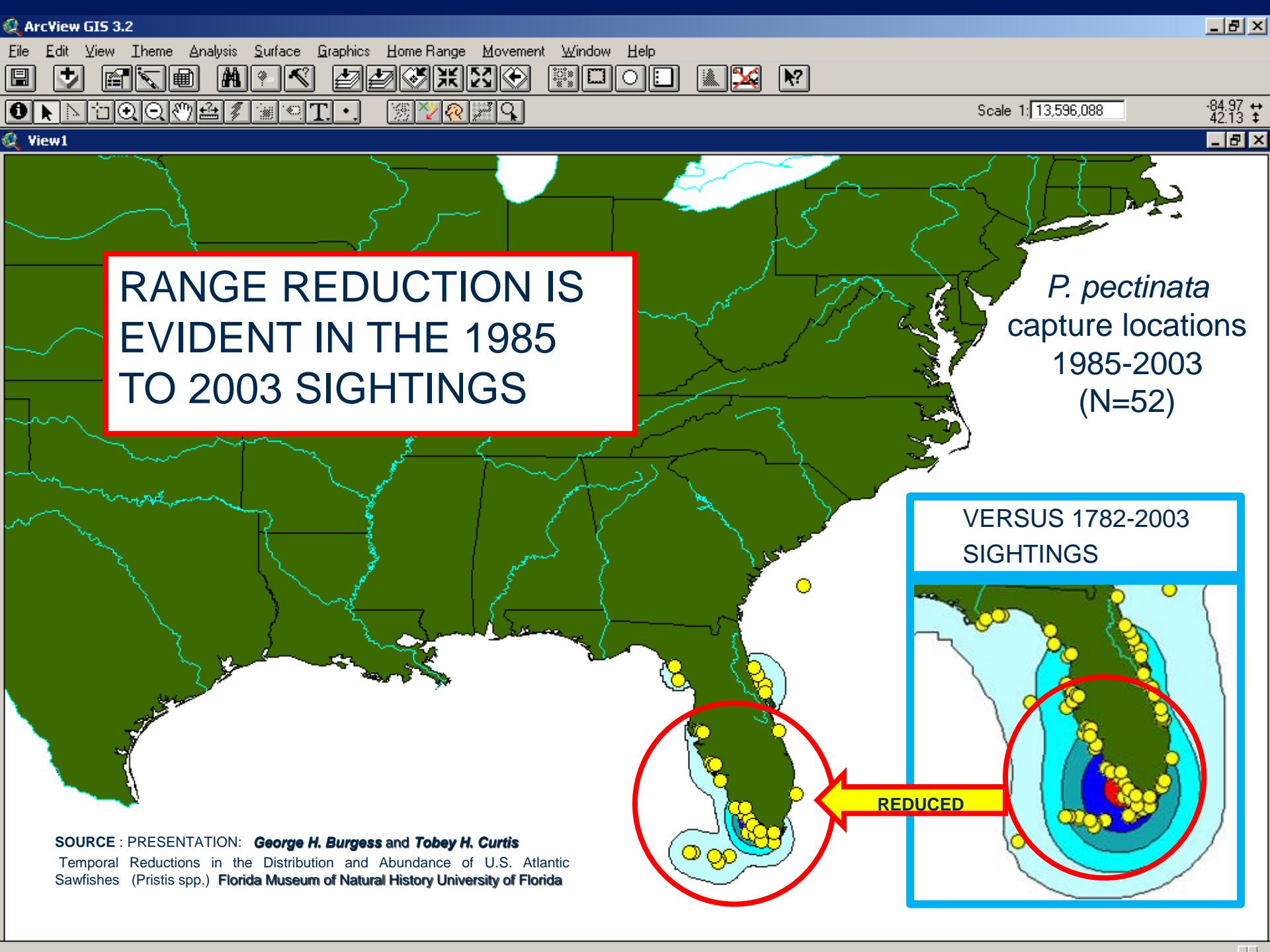
HISTORIC RANGE OF SMALLTOOTHED SAWFISH



SOURCE:
FLORIDA
NATURAL
HISTORY
MUSEUM

**REDUCTION OF
SMALLTOOTHED
SAWFISH HABITAT
1782 - 2009**





KILLED FOR CURIOS

ROSTRUM = “SAW”

Highly modified rostrum that is an electro-sensing organ

It is illegal to remove the fish's saw (rostrum)

These will soon be a globally prohibited product under ESA guidelines

Priced at \$1,000 or more for curio cabinets, fireplace mantles, or “medicine”

FL SPECIES

P. Pectinata

24+ teeth
each side
of rostrum

P. Perotteti

< 20 teeth
each side
of rostrum



SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) Florida Museum of Natural History University of Florida



DEATHS BY ENTAGLEMENT

- Gillnets
- Longlines

FLORIDA REGULATION!

In 1994 Florida banned the use of gillnets, a significant entanglement source for inshore sawfish

This action was suggested as the primary factor in their recent signs of “recovery”.

SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) Florida Museum of Natural History University of Florida

Endangered Species Act U.S. Federal Register April 1, 2003

[Docket No. 000303059-3
021700B]

RIN No. 0648-XA49

Endangered and Threatened Species; Final Endangered Status for a Distinct Population Segment of Smalltooth Sawfish (*Pristis pectinata*) in the United States

AGENCY: National Marine Fisheries
Service (NMFS), National Oceanic and
Atmospheric Administration (NOAA),
Commerce.

ACTION: Final rule; technical amendment

NMFS published a proposed
revision of

SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (*Pristis* spp.) Florida Museum of Natural History University of Florida

GLOBAL Sawfish Species Critically Endangered

(CONSERVATION: if not now.....)

SOURCE: ABITER NEWS (IUCN)

<http://www.arbiternews.com/2014/03/20/all-sawfish-species-critically-endangered/>



SFU Public Affairs and Media Relations, Flickr Creative Commons

“Once common in over 80 countries, according to several estimates the range of sawfish distribution has been reduced by as much as 90 percent with populations numbers declining as low as 95 percent. *In danger of extinction largely due to overfishing and habitat loss..*”

Sawfish are soon to get worldwide ESA protection.

Nov. 2014 sawfish added to the Appendices of the Convention on (International) Migratory Species (CMS)

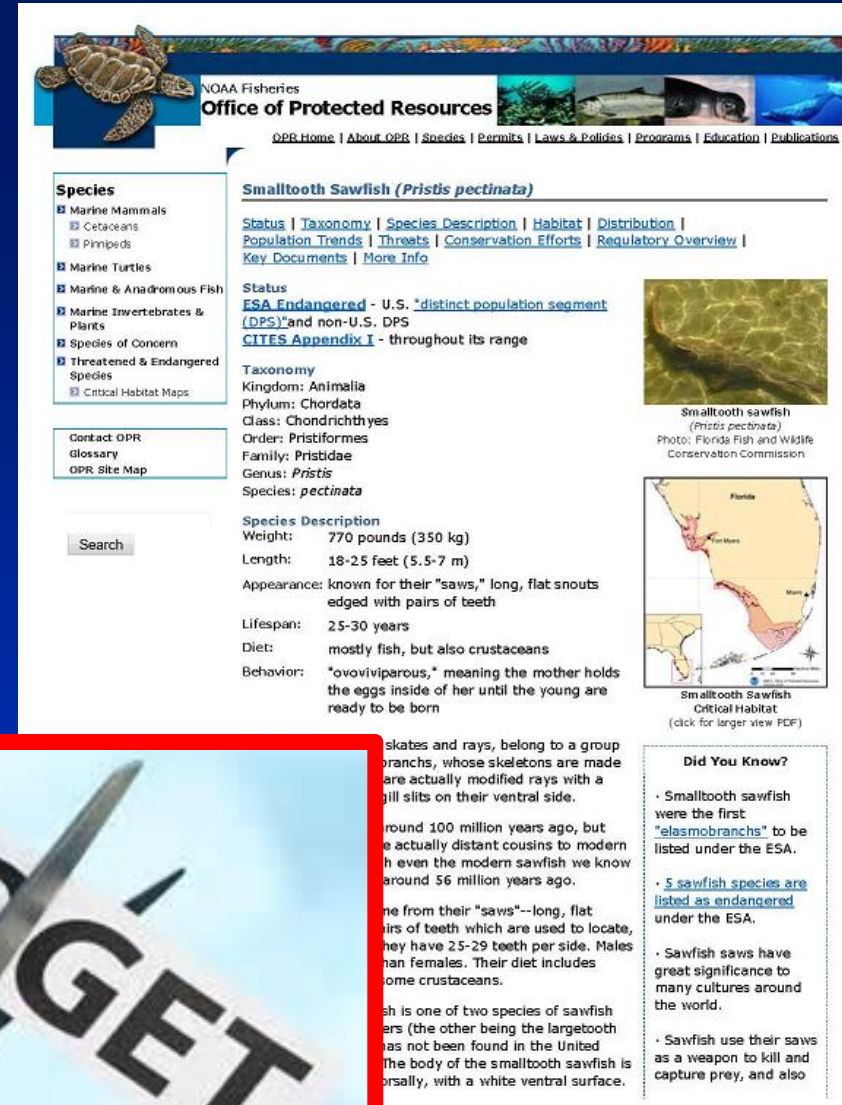
Source: <http://www.sciencedaily.com/releases/2014/11/141110110209.htm>

DESPITE 2009 ESA LISTING

NOAA's smalltooth sawfish program URL:

<http://www.nmfs.noaa.gov/pr/species/fish/smalltoothsawfish.htm>

....has and likely will see budget cuts



The screenshot shows the NOAA Fisheries Office of Protected Resources website for the Smalltooth Sawfish (*Pristis pectinata*). The page includes a navigation menu with links to Home, About OPR, Species, Permits, Laws & Policies, Programs, Education, and Publications. The main content area is divided into sections: Species (listing Marine Mammals, Cetaceans, Pinnipeds, Marine Turtles, Marine & Anadromous Fish, Marine Invertebrates & Plants, Species of Concern, Threatened & Endangered Species, and Critical Habitat Maps), Contact OPR, Glossary, and OPR Site Map. The Smalltooth Sawfish section provides detailed information: Status (ESA Endangered - U.S. "distinct population segment (DPS)" and non-U.S. DPS; CITES Appendix I - throughout its range), Taxonomy (Kingdom: Animalia, Phylum: Chordata, Class: Chondrichthyes, Order: Pristiformes, Family: Pristidae, Genus: *Pristis*, Species: *pectinata*), Species Description (Weight: 770 pounds (350 kg), Length: 18-25 feet (5.5-7 m), Appearance: known for their "saws," long, flat snouts edged with pairs of teeth, Lifespan: 25-30 years, Diet: mostly fish, but also crustaceans, Behavior: "ovoviviparous," meaning the mother holds the eggs inside of her until the young are ready to be born), and a map of Florida showing the critical habitat. A "Did You Know?" section lists facts: Smalltooth sawfish were the first "elasmobranchs" to be listed under the ESA; 5 sawfish species are listed as endangered under the ESA; Sawfish saws have great significance to many cultures around the world; and Sawfish use their saws as a weapon to kill and capture prey, and also

skates and rays, belong to a group of elasmobranchs, whose skeletons are made of cartilage. They are actually modified rays with a series of gill slits on their ventral side. Smalltooth sawfish lived around 100 million years ago, but they are actually distant cousins to modern sharks. Even the modern sawfish we know today lived around 56 million years ago. They are named from their "saws"--long, flat snouts with rows of teeth which are used to locate and catch prey. They have 25-29 teeth per side. Males are larger than females. Their diet includes fish and some crustaceans. The smalltooth sawfish is one of two species of sawfish in the United States (the other being the largetooth sawfish). The body of the smalltooth sawfish is covered in bony scutes dorsally, with a white ventral surface.



SOURCE: news.tes.co.uk

Federal Protected Species

Sawfish (or any part of) are prohibited from all harvest, possession, landing, purchase, sale or exchange:

If a sawfish is hooked or netted it should be released immediately.

Do not attempt to bring a sawfish close to you or your vessel.


General Release Guidelines for Sawfish:

Do not remove the saw (rostrum) or injure the animal in any way.

Remove as much fishing gear as safely possible

Use extreme caution when handling and releasing sawfish as the saw can thrash violently from side to side.

NOTICE TO RECREATIONAL AND COMMERCIAL FISHERS



Sawfish are listed as endangered under the Endangered Species Act, which makes it illegal to harm, harass, or handle them in any way. It is illegal to hook or net one, except with a permit or in a permitted fishery. Accidental captures do occur while fishing for other species; if a sawfish is hooked or netted it should be released immediately. Remove as much fishing gear as safely as possible. **DO NOT REMOVE THE SAW.**


Sawfish Safe Release Guidelines

If hooked:

- Keep sawfish in the water at all times.
- If it can be done safely, untangle the line if it is wrapped around the saw and remove as much of the line as possible.
- Cut the line as close to the hook as possible.
- Do not handle the animal or attempt to remove any hooks on the saw unless you have a long-handled de-hooker.

If tangled in a net:

- Make every effort to free the animal from the net with minimal additional stress or injury.
- Keep sawfish, especially the gills, in the water as much as possible.
- Try to remove all the netting and release the animal quickly.
- **DO NOT REMOVE THE SAW.**



WARNING: Sawfish are large powerful animals that can cause serious injury. For your safety, and the safety of the sawfish, use caution if you do hook or net one of these animals.


Reporting a Sawfish Encounter

The Florida Museum of Natural History, Mote Marine Laboratory, and FWC have established a sawfish tracking database to assist in sawfish conservation efforts. If you do accidentally encounter a sawfish, you can greatly help conservation efforts by providing the following information:

- Your name, phone number, and email address
- Date, time, and location of the encounter
- Number, size, and behavior of the sawfish during encounter
- Your activity at time of encounter
- Information on any tags, scars, or distinguishing marks

Please report this information to any of the below contacts:

George H. Burgess Florida Museum of Natural History Email: sawfish@fmnh.ufl.edu Phone: (352) 392-2360	Colin Simpfendorfer Mote Marine Laboratory Email: sawfish@mote.org Phone: (941) 388-4441	Gregg Poulakis FL Fish and Wildlife Conservation Commission Email: sawfish@myfwc.com Phone: (941) 255-7403
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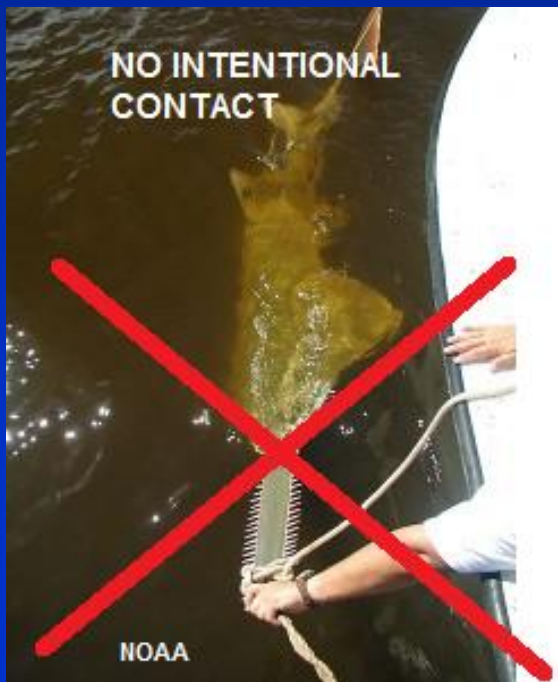


USA ESA PROTECTION 2003

PENALTIES



Unauthorized handling of a species protected under the Endangered Species Act may cost the offender anywhere from \$500 to \$10,000 or more, with fines increasing with the number of violations. Simply harassing a sawfish can cost anywhere from \$1000-\$10,000 for a first violation; capturing it holds a penalty of \$2,000 or higher.



Not having a bony skeleton means rough handling could be a life threatening event for the sawfish.

SOURCE :

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishencounters.htm>

DESPITE USA REGULATIONS...

05/27/14 HUFFINGTON POST:

“After a two-hour fight, a South Florida man and his fishing buddies reeled in an unusual catch: a rare species of sawfish, reports note. Named for its characteristic snout, or rostrum, the sawfish is seldom spotted in the wild. All of the known species are considered endangered or critically endangered.

*Dustin Richter and his friends caught the ray early Sunday morning after midnight. The group **pulled the catch to shore and made sure to get proof before releasing it** back into the waters off Boynton Beach.”*

This does not seem handled according to FWC guidelines:

<http://myfwc.com/research/saltwater/fish/sawfish/faq/>

“If a smalltooth sawfish is accidentally caught, it must be promptly released unharmed.”

WPBF 25 NEWS
05/25/14 Boynton Beach



POSSIBLE MITIGATION THROUGH OUTREACH: GET THE WORD OUT FURTHER TO ANGLERS

Ex: more signage NEEDED at docs (this at ENP),
Flamingo)



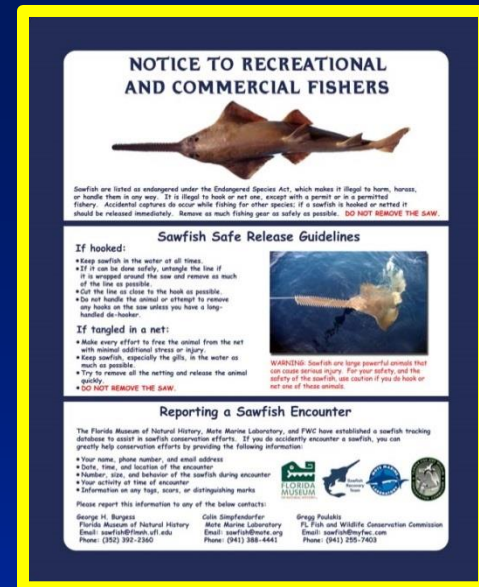
> MINIMIZE ENCOUNTER TO
PROTECT SAWFISH

> TRY NOT TO LAND THEM

*Don't take the time for that
photo opportunity or your
fishing experience might
contribute to a future
conversation with your
(grand)kids;*

“yeah I remember sawfish”

**SAWFISH ARE A PART OF THE FLORIDA EXPERIENCE
LET'S KEEP IT THAT WAY!**



ANOTHER 2014 CASE OF SAWFISH MISHANDLING IN FLORIDA KEYS



“..a young angler posted photos of himself and his friends posing with a sawfish he'd caught in the Florida Keys. (He) and several others claimed to have "cut off the saw and hung it on my wall as a trophy," and made it into "sawfish fin soup" – which turned out to not be true - they did in fact release it. But in both cases handling surpassed legal guidelines for ESA based prosecution

SOURCE: This Disaster On Twitter Is Why You Shouldn't Harass Endangered Animals
<https://www.thedodo.com/sawfish-twitter-illegal-angler-907608487.html>

REASONS FOR HOPE FOR *P. pectinata*

2 opinions

POPULATION INCREASING ?

“In the past few years, sawfish have been turning up more frequently in parts of their old range. Divers have encountered them in submerged wrecks off Jupiter. One turned up in Port Everglades in 2012, although it was dead and tangled in a fishing line.

“We’re seeing signs that the population may be recovering slowly,” said Dean Grubbs, associate director of research at the Florida State University Coastal & Marine Laboratory, who has placed satellite tags on the sawfish.

In addition to spreading out to new areas, George Burgess said, “we do have hints that there are more of them” in their core range..

”” Gregg Poulakis, a biologist with the Florida Fish and Wildlife Conservation Commission, said he isn’t sure a recovery is underway.

POPULATION STABLE ?

“..I think it’s a little too early to tell,” said Poulakis, who has done years of field research on sawfish. “There’s no (fishery independent) analysis I’m aware of that shows the population is increasing. They’re stable for sure.”

RESTOCKING HOPE (?): FUTURE TECHNIQUES FOR REPPRODUCTION AND RELEASE

April 12, 2012 Atlantis Aquarium, Paradise Island Bahamas, achieved a major milestone as the first and only facility in the world to have reproductive success of the smalltooth sawfish. By systematically tracking and documenting the reproductive activity of the adults, conducting routine examinations, ultrasounds and drawing blood for hormonal studies, two male and two female pups were born at the facility, a first in the aquarium industry, (two seen below)

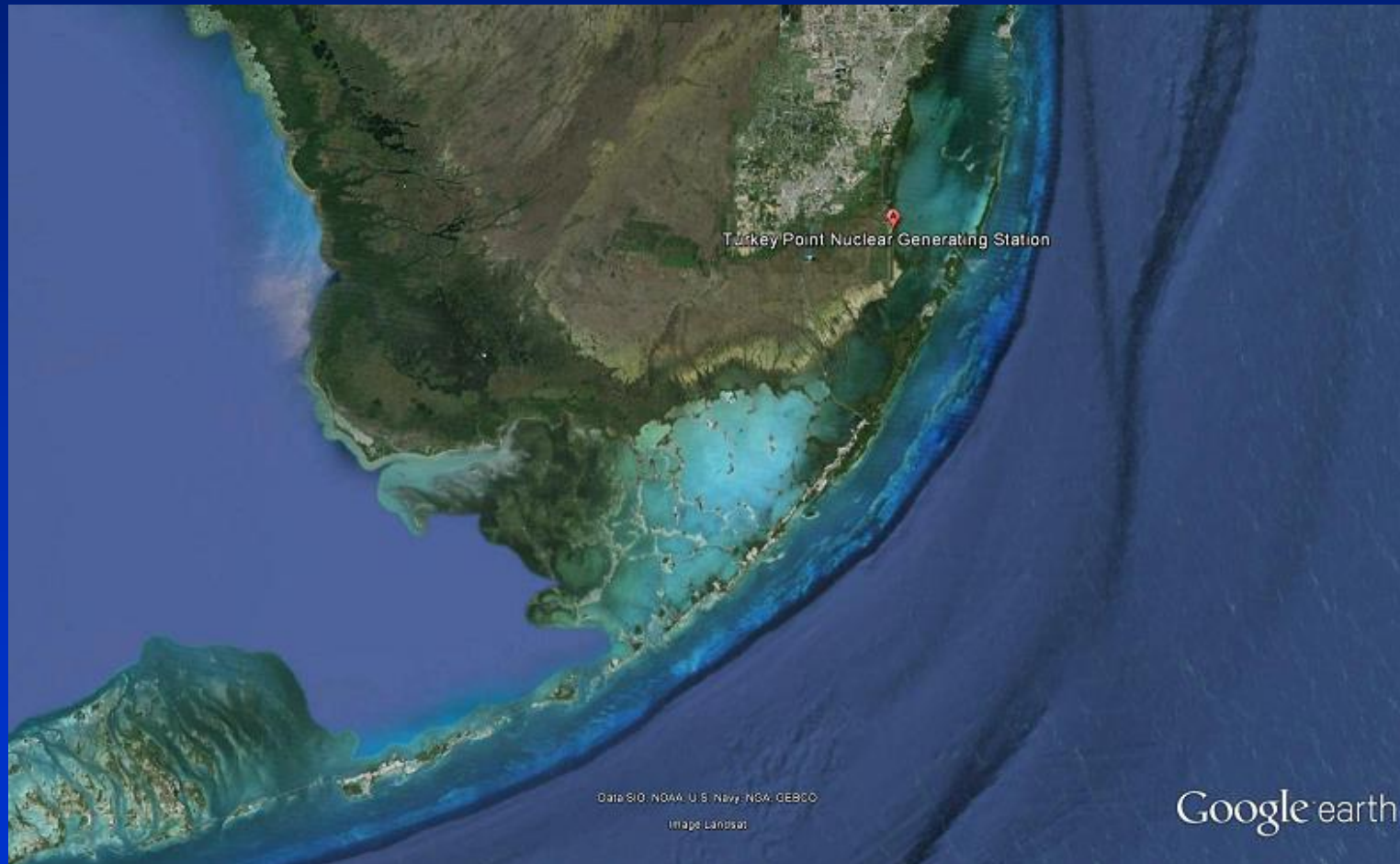


SOURCE: <http://www.bahamaslocal.com/>

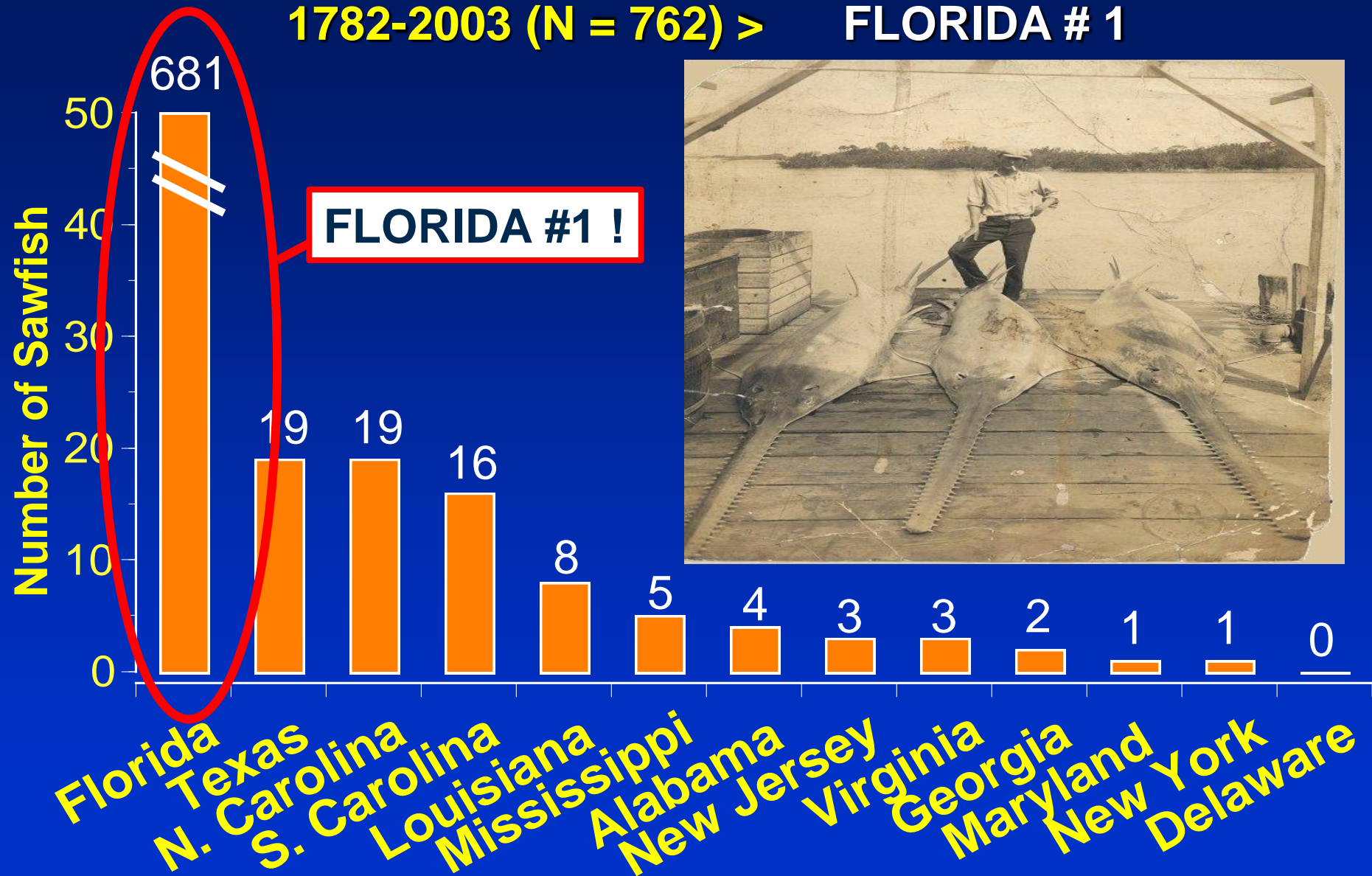
http://www.bahamaslocal.com/newsitem/50438/The_endangered_Smalltooth_Sawfish_gives_birth_at_Atlantis_Paradise_Island.html

WHAT DO WE KNOW ABOUT SMALLTOOTH SAWFISH HISTORICAL AND CURRENT RANGE

HOW DOES BISCAYNE BAY FIT INTO BOTH?



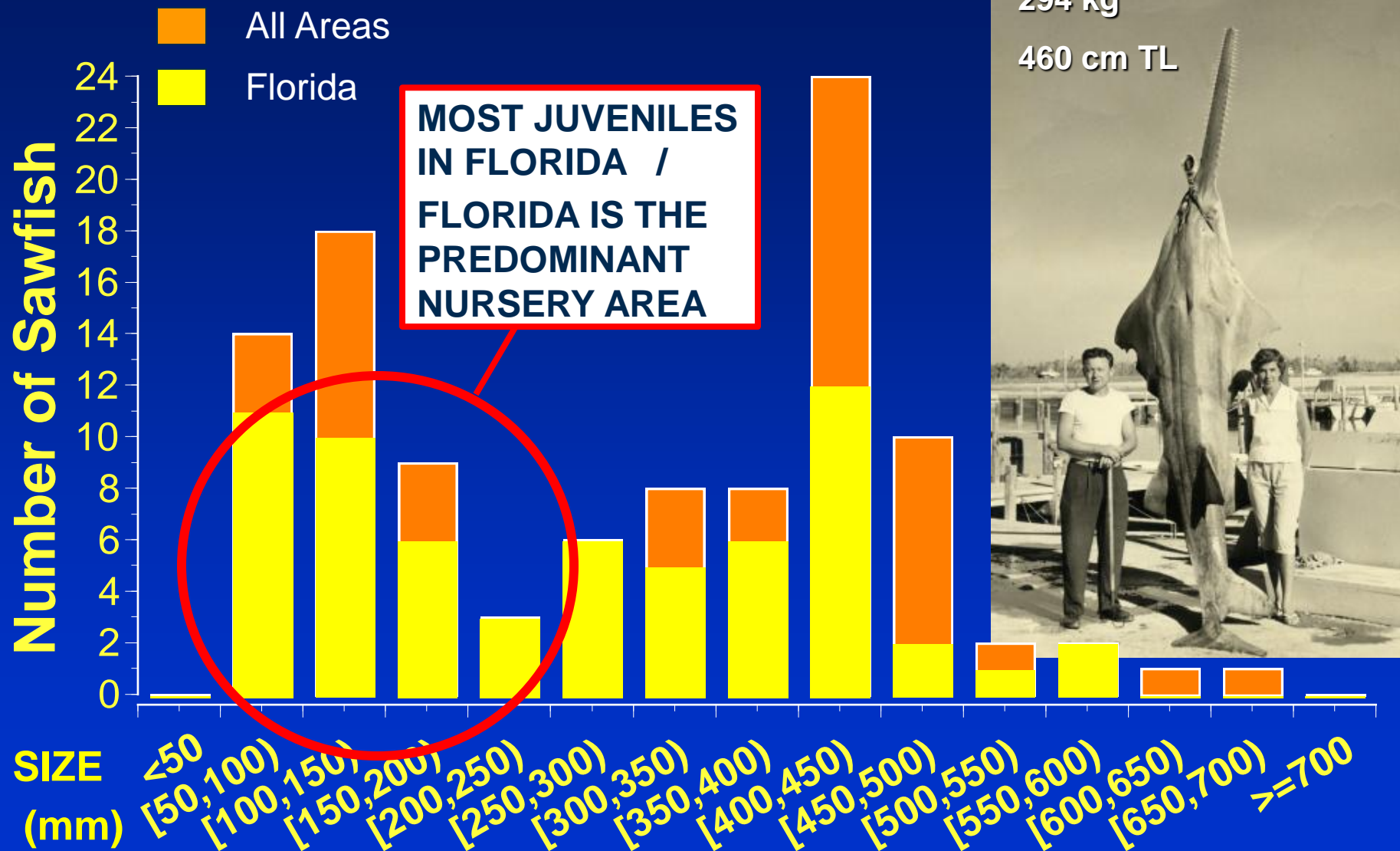
Numbers of *Pristis pectinata* captured by State 1782-2003 (N = 762) > FLORIDA # 1



SOURCE : PRESENTATION: George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (*Pristis* spp.) Florida Museum of Natural History University of Florida

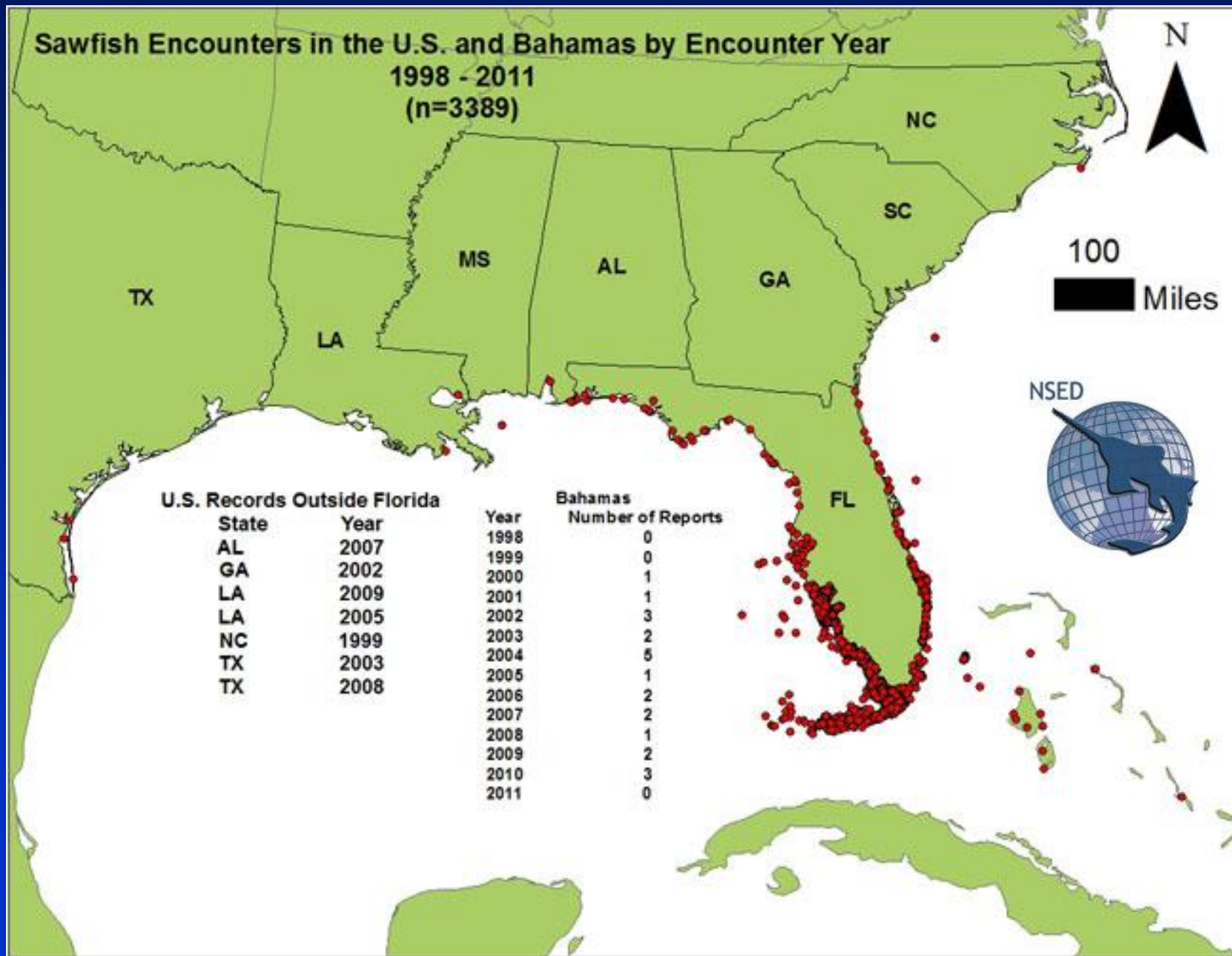
Length Frequency of *Pristis pectinata* captured 1782-2003 (N = 106)



Where do we find juveniles?

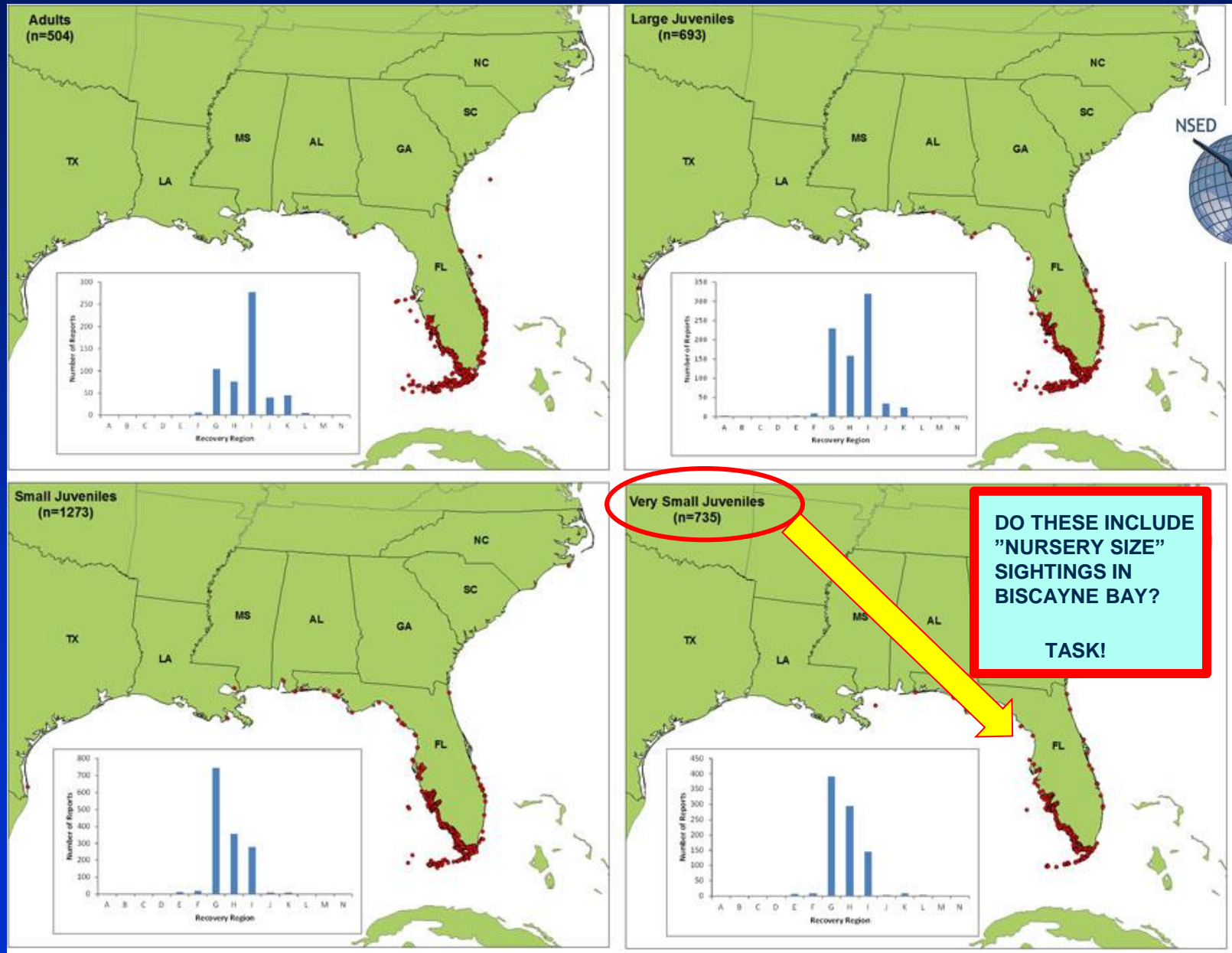
What nursery habitat characteristics are known?

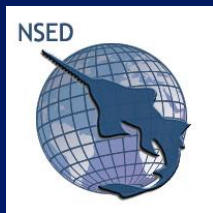




U.S. geographic distribution of reported sawfish encounters by size class from 1998 to May 2011 (n= number of reports);

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/mapthree.html>





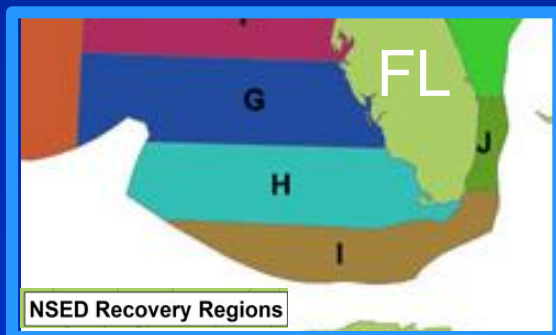
Yellow dots (& bars) denote very small juvis

Notice that the most are found in NSED Recovery Regions;

(H) > approx 43, then

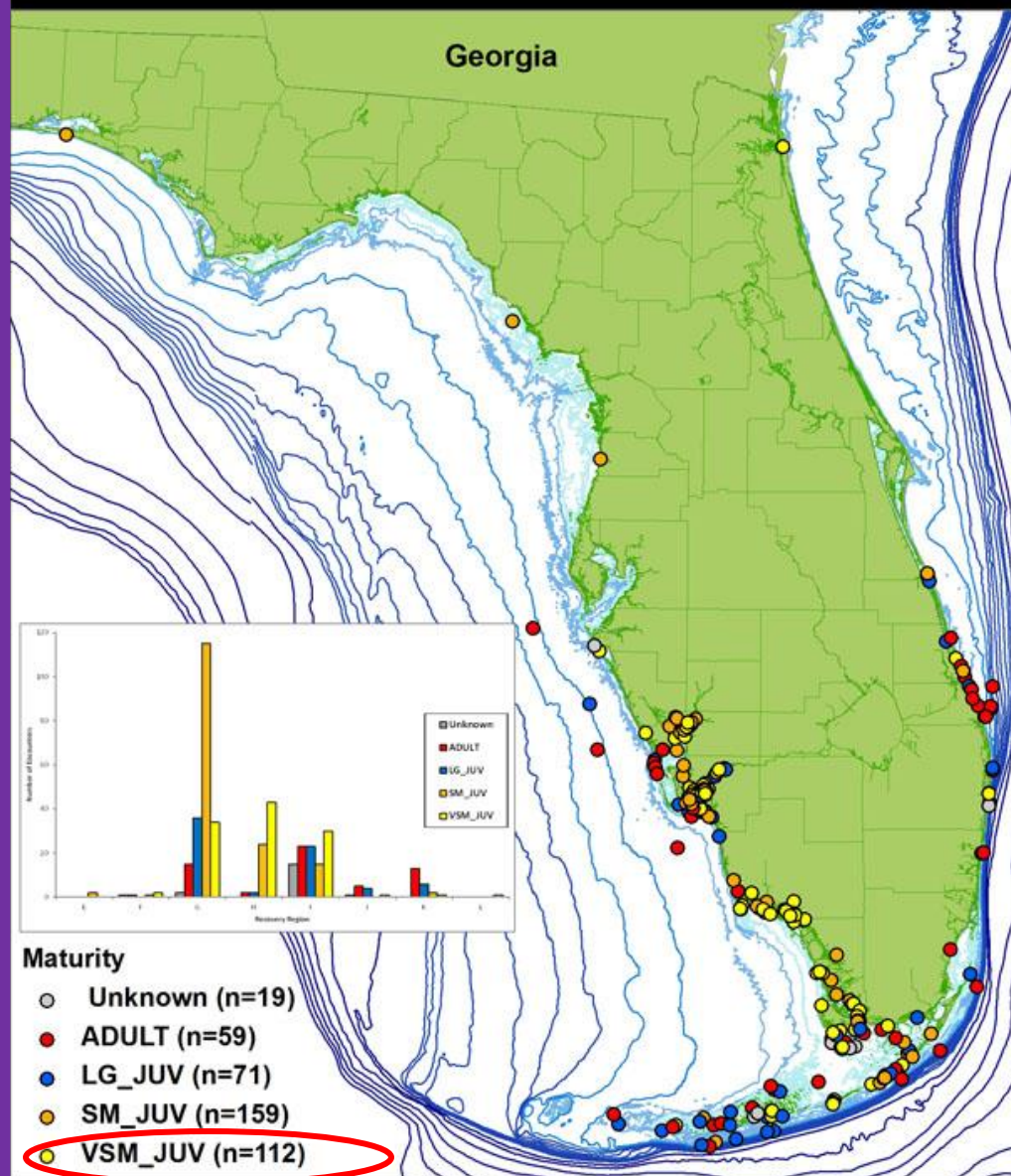
(G) > approx. 36; then

(I) > approx 30



Notice that are found from Tampa to ENP and up to West palm beach County

U.S. Sawfish Encounters May 2010 - May 2011



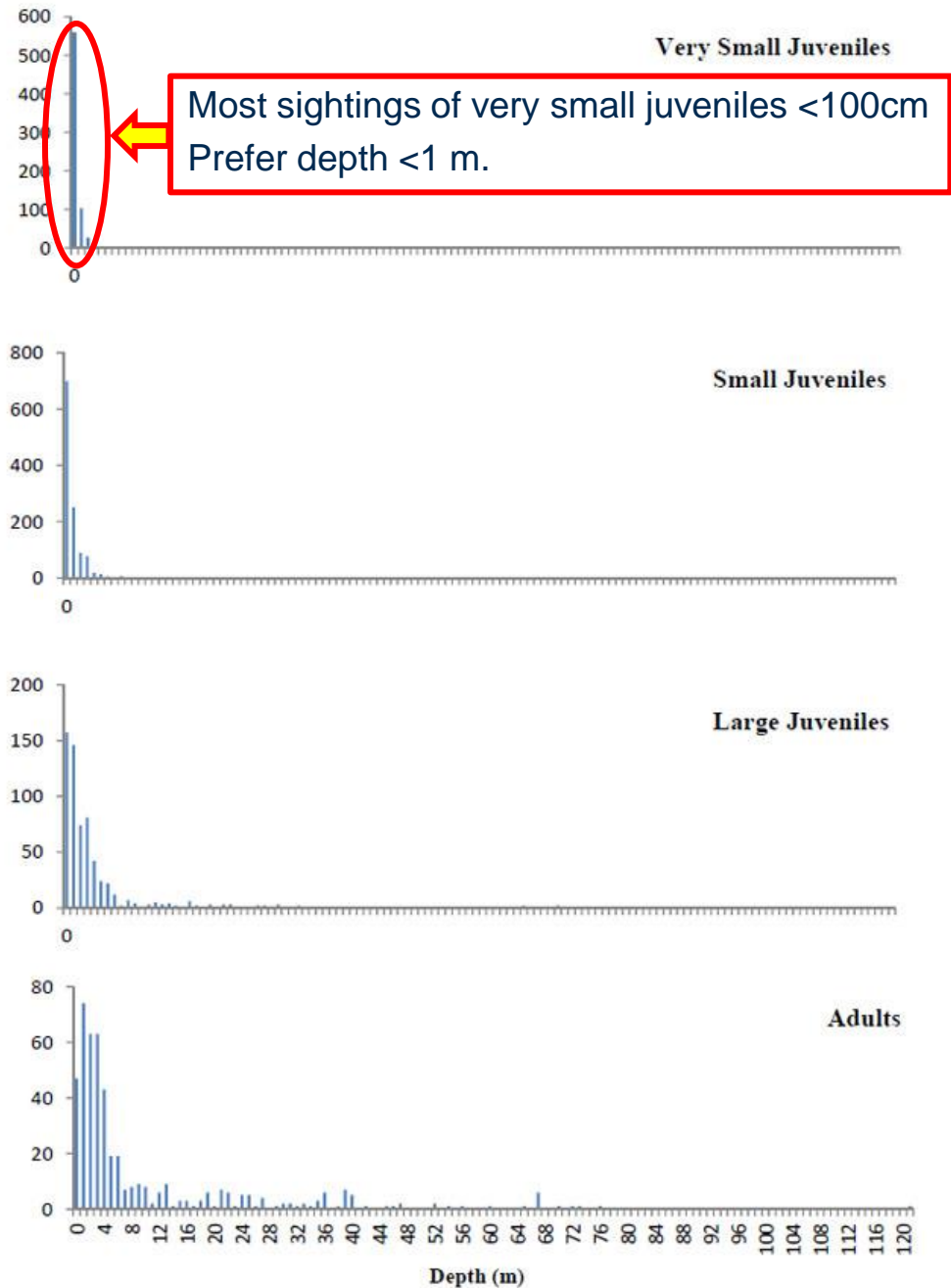
SOURCE: <http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishdatabase.html>

Depth distribution of reported U.S. sawfish encounters by size from January 1998 to May 2011, by number of reports.

Adults >340 cm TL,
large juveniles >200<340 cm,
small juveniles >100<200 cm,
very small juveniles <100cm

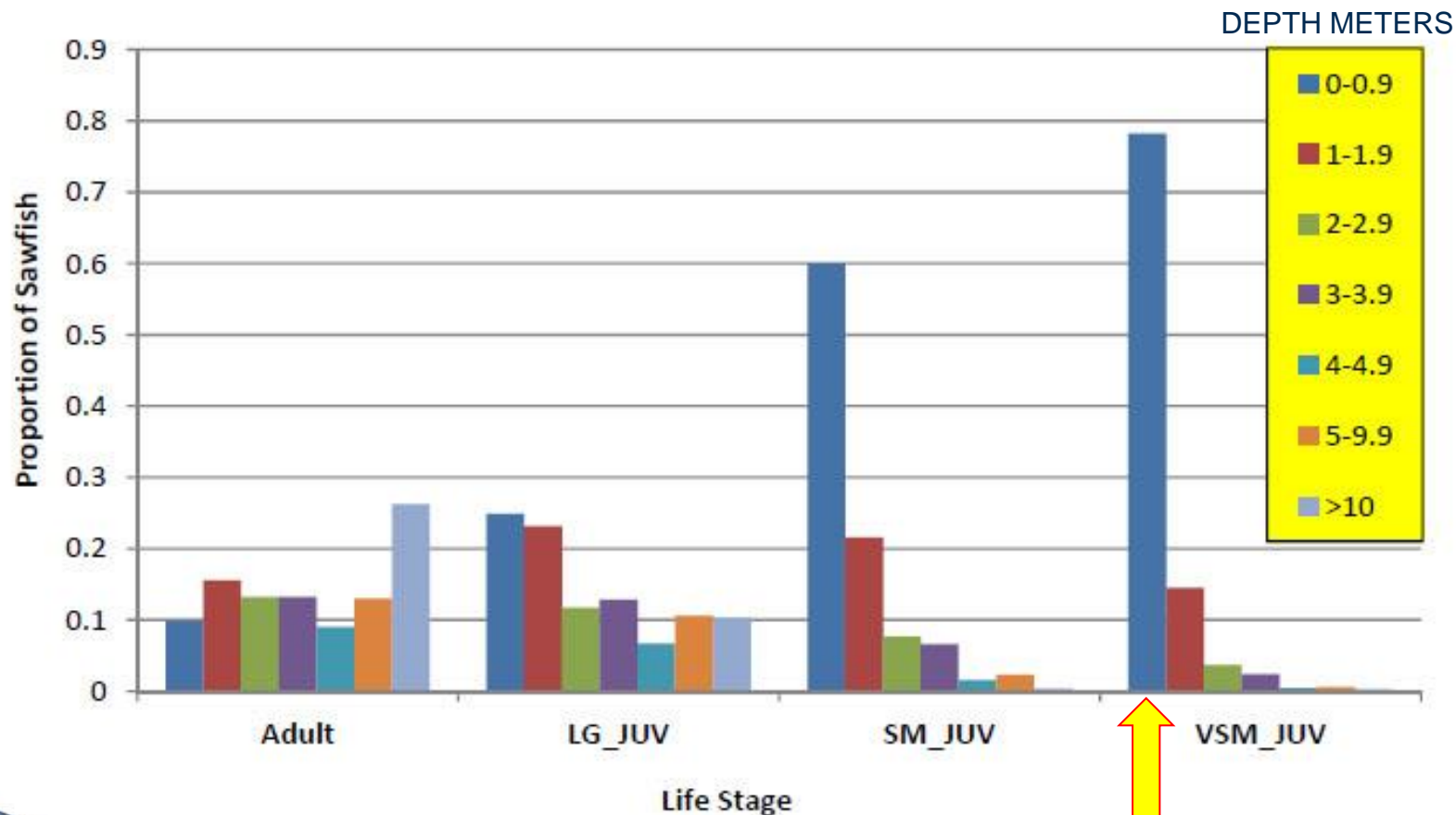
SOURCE:

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/datathree.html>



Depth distribution of U.S. sawfish encounters by length class from January 1998 to May 2011. Adults >340 cm TL, large juveniles >200<340 cm, small juveniles >100<200 cm, very small juveniles <100cm

SOURCE: <http://www.flmnh.ufl.edu/fish/sharks/sawfish/datafour.html>

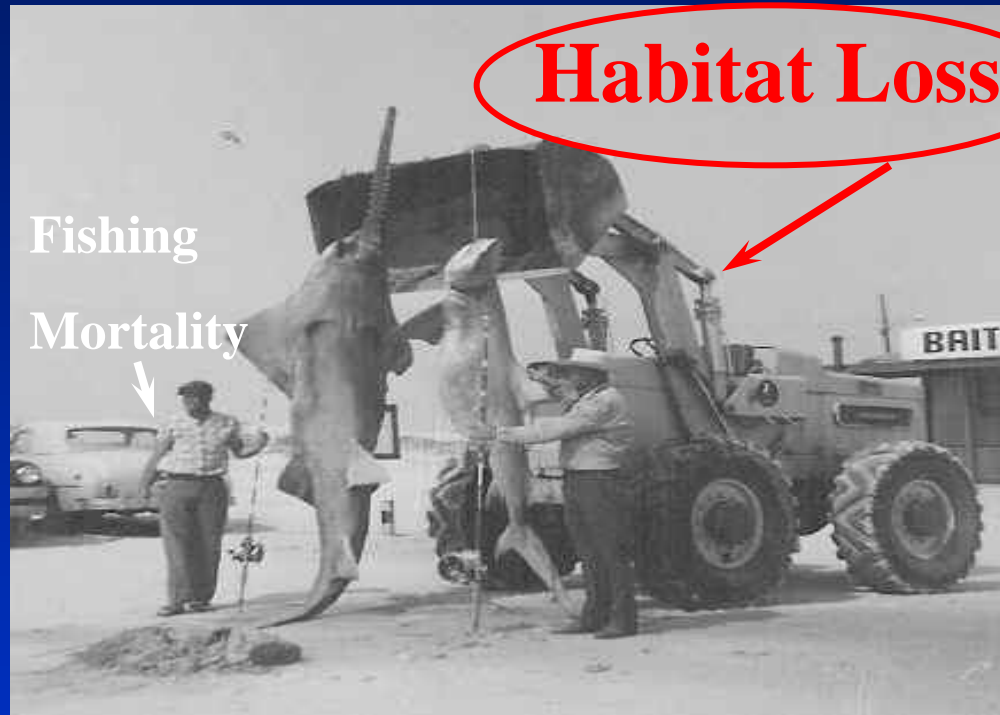


NSED



Near 80% of very small juveniles <100cm
Prefer depth <1 m.

WHICH CONSERVATION ISSUE SHOULD BE TACKLED FIRST?



It doesn't matter which came first "the chicken or the egg" if there is no habitat

SOURCE : PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

2009 DESIGNATION OF “CRITICAL HABITAT” 2009

(74 FR 45353) LINK:

<https://www.federalregister.gov/articles/2009/09/02/E9-21186/endangered-and-threatened-species-critical-habitat-for-the-endangered-distinct-population-segment-of>

SOURCE: NOAA SAWFISH MANAGEMENT AND CONSERVATION

<http://www.nmfs.noaa.gov/pr/pdfs/criticalhabitat/smalltoothsawfish.pdf>

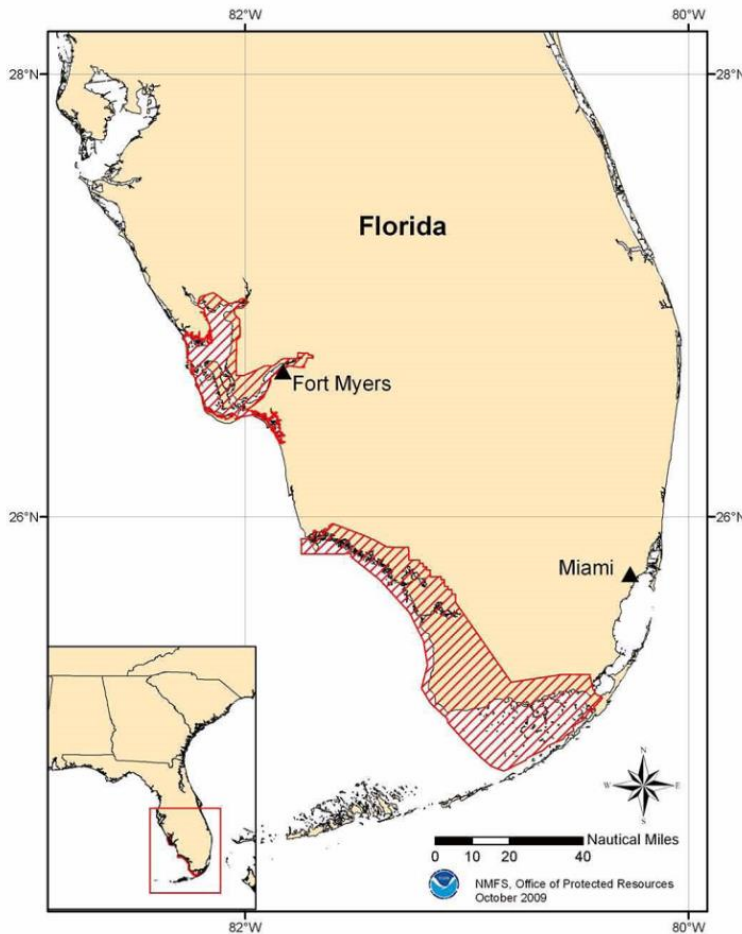
GOAL: NEED TO FACILITATE RECRUITMENT BY PROTECTING JUVENILE NURSURY AREAS

REQUIRES: as defined “2 Essential Features” necessary to facilitate recruitment of juveniles (69 – 340 cm) into the adult population, because they provide for predator avoidance and habitat for prey in the areas currently being used as juvenile nursery areas

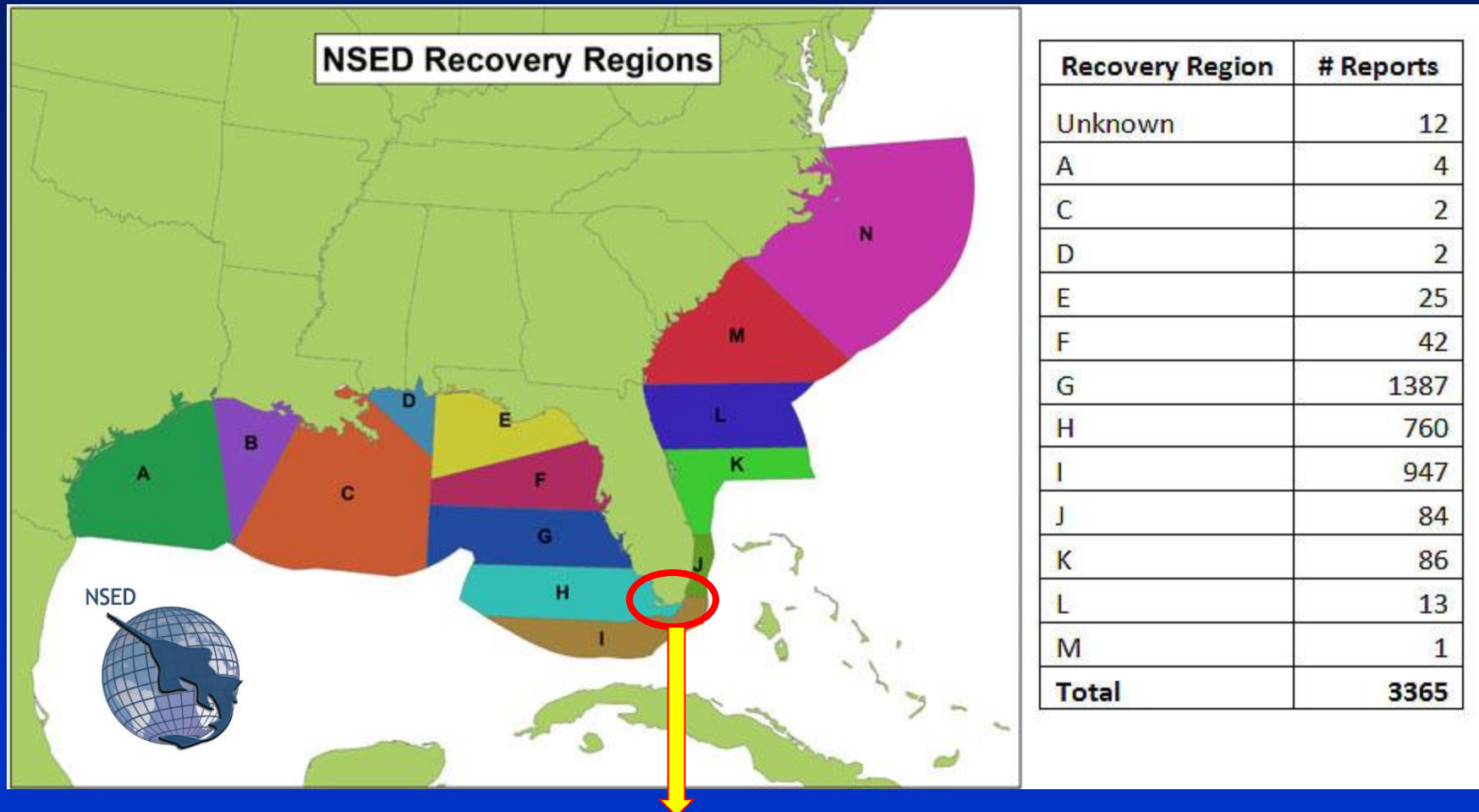
- 1) Red mangrove shorelines
- 2) Shallow euryhaline habitats characterized by water depths between Mean High Water line (MHW) and 3 feet (0.9m) measured Mean Lower Low Water (MLLW)

Norton, Shelley L., et al. "Designating critical habitat for juvenile endangered smalltooth sawfish in the United States." *Marine and Coastal Fisheries* 4.1 (2012): 473-480.

Smalltooth Sawfish Critical Habitat



Location of the recovery regions established in the Smalltooth Sawfish Recovery Plan and their respective number of reports from 1998 to May 2011

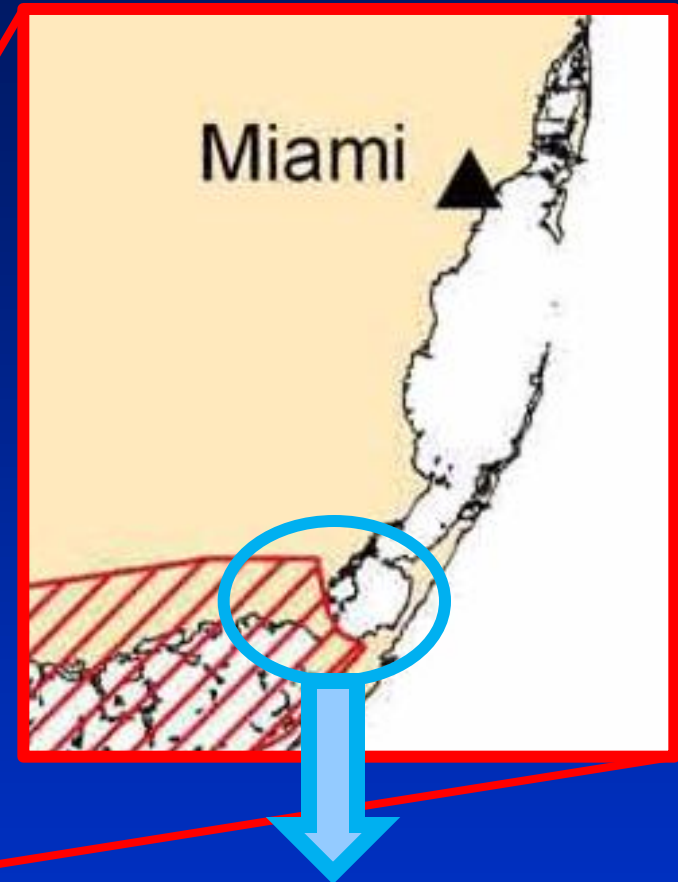


SW Biscayne Bay lies at the boundary between;
 Recovery Region (H) > 760 sightings (**protected CNH status**) and
 Recovery Region (I) > 940 sightings (**no CNH status**)

“CRITICAL HABITAT” BOUNDRY NOT DRAWN BY DEPTH AND RED MANGROVE CRITERIA



SOURCE: NOAA SAWFISH MANAGEMENT AND CONSERVATION



E BOUNDRY SET BY US 1 in the 2009 ESA listing based on ;“*easy to find navigation points on maps*” over “*water depth/ red mangrove shoreline*” criteria as listed in plan

NOT LIKLEY REPRESENTATIVE OF HISTORIC NURSERY RANGE



The recovery plan states ;

“the **recovery** of the smalltooth sawfish **depends on the availability and quality of nursery habitats and the protection of high-quality nursery habitats**”



SOURCE: MANGROVETREES.ORG



SOURCE: NOAA

The recovery plan states ;

However- the final call as to what constitutes “Critical Nursery habitat” was not based on the salinity and depth regimes listed, but one based on consensus and “identifiable topographical landmarks”;



**“EASY TO IDENTIFY
BOUNDARY “TRUMPS
HABITAT SCIENCE**

“We evaluated information in the recovery plan, historical information on habitat use by sawfish, and available encounter data and scientific literature, as well as sought expert opinion, to determine where or what constitutes a “nursery area” for the species.”

“ The boundaries of the critical habitat units were identified in accordance with our regulations at 50 CFR 424.02(c), **using reference points and lines on topographic maps to describe the specific boundaries of the nursery areas. Roads, man-made structures, and county line or park boundaries were used instead of habitat boundaries (e.g., extent of red mangroves or entire creek systems) because they are easily identifiable by the public and because they represent the boundaries of the nursery areas.”**

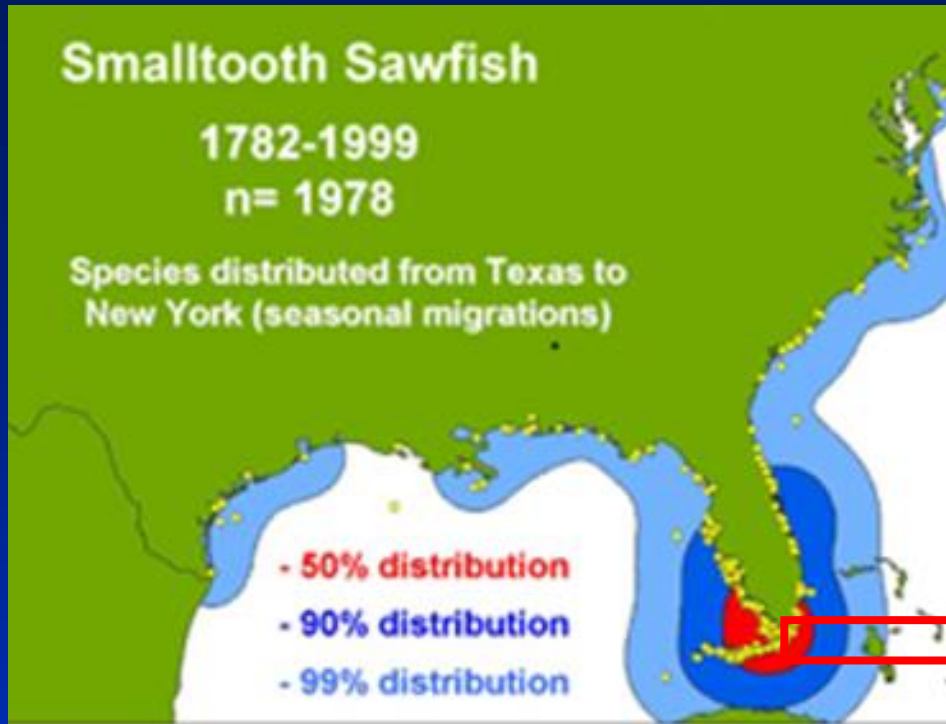
“.....and because they represent the boundaries of the nursery areas (?)”



E BOUNDRY SET BY US 1 in the 2009 ESA listing based on ;“*easy to find navigation points on maps*” over “*water depth/ red mangrove shoreline*” criteria as listed in plan

NOT LIKELY REPRESENTATIVE OF HISTORIC NURSERY RANGE





BISCAYNE BAY

OBVIOUSLY HISTORIC NURSERY HABITAT



Shallow estuaries and other coastal areas are extremely important, as they are used as nursery areas for juvenile sawfish. For Biscayne Bay, activities like water rerouting, constructing seawalls, removing mangroves and dredging have reduced juvenile sawfish habitat and affected their reproductive abilities. It is very likely SE Florida was also a major nursery area pre water redistribution / canalization affecting freshwater flow.

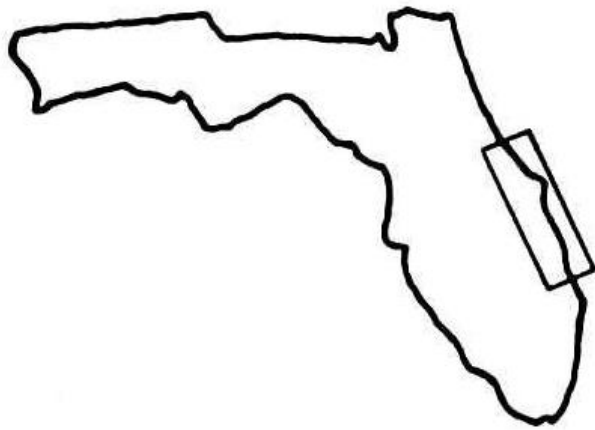
CURRENT SAWFISH HABITAT ARSENICKERS (?)



INDIAN RIVER LAGOON

**A CASE SIMILAR TO
BISCAYNE BAY**

**HISTORICAL (REDUCTION)
CHANGE DUE TO
DEVELOPMENT**



**300 + records from the
Indian River Lagoon**

*“an abundant species,
permanently resident in the
Indian River.”*

(Evermann and Bean, 1897)



SOURCE : (MODIFIED) PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

rtis

COASTAL DEVELOPMENT



INDIAN RIVER LAGOON

**A CASE SIMILAR TO BISCAYNE
BAY**

**HISTORICAL (REDUCTION)
CHANGE DUE TO DEVELOPMENT**

**Extirpated from the Indian
River Lagoon**

*“The disappearance of this
large ray from the Indian
River system has been
dramatic.”*

(Snelson and Williams, 1981)



SOURCE : MODIFIED PRESENTATION:

George H. Burgess and Tobey H. Curtis

Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) **Florida Museum of Natural History University of Florida**

THE SAWFISH RESTRICTED HABITAT CRITERIA WAS BASED ON SHARK INFORMATION SINCE THERE WAS NOT ENOUGH FUNCTIONAL SAWFISH INFORMATION

SHARK PUBLICATION:

Heupel, Michelle R., John K. Carlson, and Colin A. Simpfendorfer. "Shark nursery areas: concepts, definition, characterization and assumptions." Marine Ecology Progress Series 337 (2007): 287-297. <http://researchonline.jcu.edu.au/2614/>

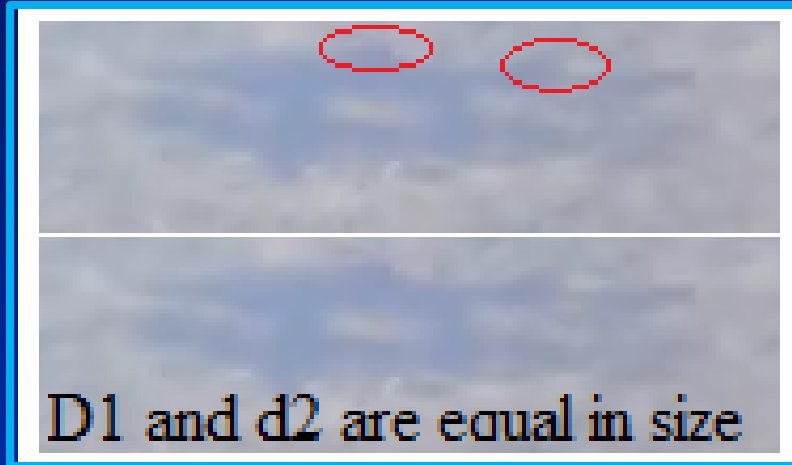
Used by the authors of the 2009 sawfish listing, Heupel et al. (2007) defined shark “nursery areas” based on three primary criteria:

- (1) Juveniles are more common in the area than other areas, i.e., density in the area is greater than the mean density over all areas;*
- (2) juveniles have a tendency to remain or return for extended periods (weeks or months), i.e., site fidelity is greater than the mean site fidelity for all areas; and*
- (3) the area or habitat is repeatedly used across years whereas other areas are not.*

IBBEAM DRY 2015 sampling – first day out while approaching Station 44
I saw three very small sharks amongst the mangrove seedlings

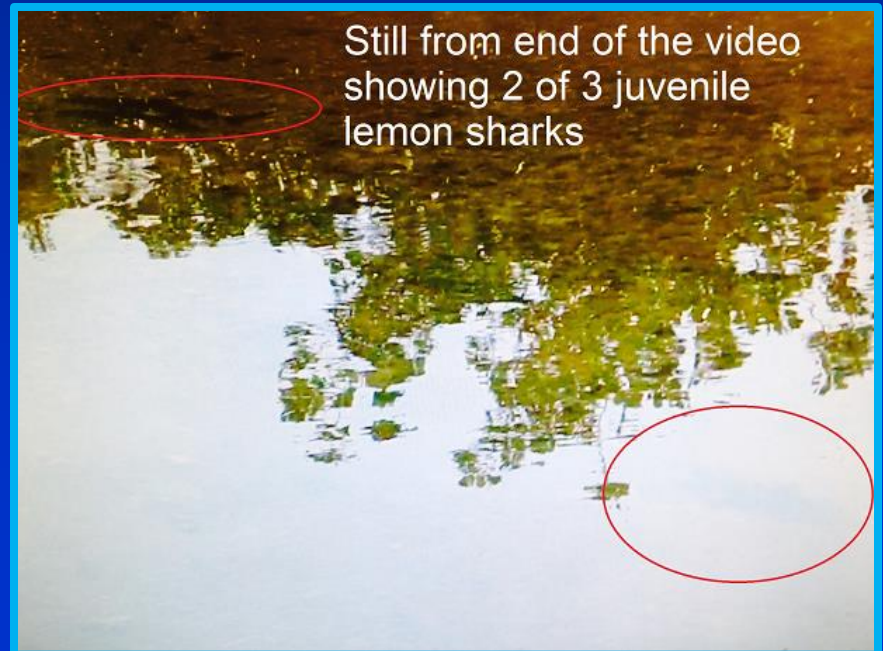


From the (very shakey) video we can still determine:



1. Identification was possible from stills these are *Negaprion brevirostris* and in the film when they move near rooted mangrove propagules a sense of scale pointed to these being neonates

2. 2 of the 3 sharks can be seen in one frame



(HOPE FOR BISBAY LISTING?!)

One of the comments included in the Designation of Critical Habitat for the Endangered U.S. Distinct Population Segment (DPS) of Guided Smalltooth Sawfish 6 actions from November 20th, 2008 to May 2009;

Comment 5: A reviewer stated that *we should consider designating other areas that contain the same essential features* included in the two nursery areas in southwest Florida.

Response: *We do recognize that the sawfish may need additional nursery areas for its recovery, that red mangroves and shallow euryhaline habitats exist outside the designated areas, and that smalltooth sawfish were historically common in some of those areas (e.g., Indian River Lagoon). However, sawfish also historically appear to have used areas that do not contain mangroves as nursery areas. The key conservation function of the critical habitat designation is to facilitate recruitment into the adult population by protecting juvenile nursery areas. Based on the best available data and our understanding of what constitutes a nursery area for sawfish, the areas designated as critical habitat are the only areas that are currently nursery areas. We cannot predict with any certainty what new nursery areas may be established by the species. If new information identifies nursery areas outside of the designated critical habitat, NMFS will consider revising this rule.*

WHAT CAN WE DO TO ASSIST RESTORATION OF SAWFISH STOCKS?

GIVENS:

- 1) The likelihood that the Biscayne Bay of “pre redistribution of water” years must have been part of the historic nursery range for this species.
- 2) Changing sea level will mean more, not less, habitat; so getting conservation measures in place will provide the location for increasing BISBAY nursery areas.

WHAT WE NEED TO DO: (GIS) TO PROPOSE BISBAY AS “Critical habitat”

- 1) Define current and future projected red mangrove bounded shoreline in Biscayne Bay.
- 2) Define current/ and if possible future water depths between “Mean High Water line (MHW) and 3 feet (0.9m) measured Mean Lower Low Water (MLLW)”, as specific to the “Critical habitat” definition for Biscayne Bay.
- 3) Determine current overlap of (1) and (2) to illustrate the current and future habitat requirements as defined by the “critical habitat” definition.
- 4) Compare (1) , (2) and (3) to the defined “northeastern boundary limit” description of the defined “critical habitat area” as well to the areas outside the current recognized critical area with the same criteria as defined (mangroves/depth etc).

BISBAY BLUEPRINT GROUP:

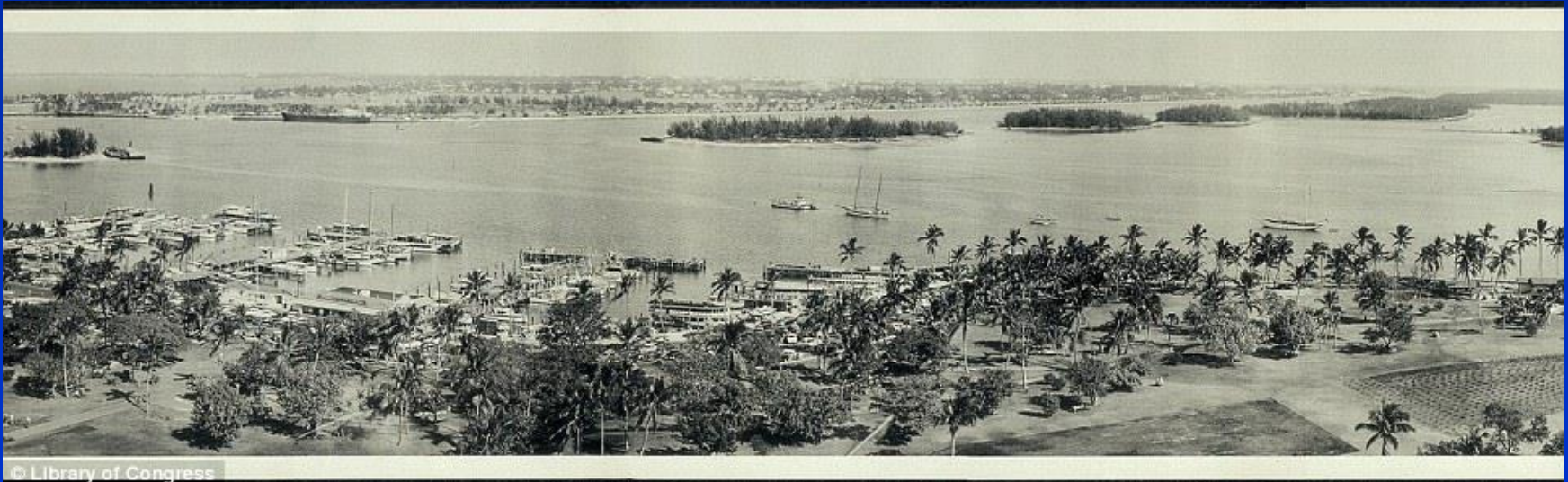
WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

- (1) COLLECT HISTORIC IMAGES OF BAY**
- (2) COMPILE LOCAL SIGHTINGS DATA**
- (3) IDENTIFY & DEFINE MANGROVE SHORELINE**
- (4) IDENTIFY AND DEFINE OVERLAP BETWEEN BISBAY AND CRITICAL HABITAT CRITERIA (2)**
 - “These specific areas contain the following physical and biological features that are essential to the conservation of this species and that may require special management considerations or protection:
 - (1) red mangroves and shallow euryhaline habitats
 - (2) characterized by water depths between the MHW line and 3 ft (0.9 m) measured at Mean Lower Low Water (MLLW).
- (5) DECIDE WHICH TYPE OF PROTECTION TO TARGET; PURSUE ESA OR HAPC?**

BISBAY BLUEPRINT GROUP: WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 1; COLLECT HISTORIC IMAGES OF BAY

Collect pre-redistribution images of Biscayne Bay to compare to current images to document reduction of “historic habitat” / red mangroves, etc.



“Down by the bay: Miami's Bay Front Park and Biscayne Bay with skyline of Miami Beach in distance”

BISBAY BLUEPRINT GROUP: WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 2; COMPILE LOCAL SIGHTINGS DATA



- a) **QUERY International Sawfish Encounter Database (ISED) at FHMM) for Biscayne Bay (bounded) sightings and**
- b) **VERIFY (GIS) Biscayne Bay sightings info for sawfish, especially juveniles to degree of “current or historic habitat” and if possible “nursery areas”**
- c) **QUERY LOCAL ANGLERS FOR HISTORIC BISBAY SIGHTINGS INFO**

TASK (2) **COMPILE LOCAL SIGHTINGS DATA** cont.

WE KNOW THEY ARE INSHORE IN BISCAYNE BAY
> NEED TO QUERRY LOCALS (IGFA had no info)



TASK (2) **COMPILE LOCAL SIGHTINGS DATA** cont.

WE KNOW THEY ARE INSHORE IN BISCAYNE BAY

JANUARY 2012 SAWFISH FOUND DEAD BISCAYNE BAY, NEAR BLACK POINT

“When the boaters found it, it was already dead and believed to have been abandoned in the water by another fisherman.”



SOURCE: :HUFFINGTON POST http://www.huffingtonpost.com/2012/01/13/sawfish-black-point-marina_n_1204244.html

TASK (2) **COMPILE LOCAL SIGHTINGS DATA** cont.

WE KNOW THEY ARE INSHORE IN BISCAYNE BAY



Sawfish! Estimated by onlookers to be 13' Length, 3.5' bill, 400lbs

Miami River at 333 Miami Ave on 5/7/2010 @11:30am

Photo by Florence Chamberlin (UPG Location Manager for El Portal: UPG-ElPortal@hotmail.com)

URBAN PARADISE GUILD – www.urban-paradise.org

BISBAY BLUEPRINT GROUP:

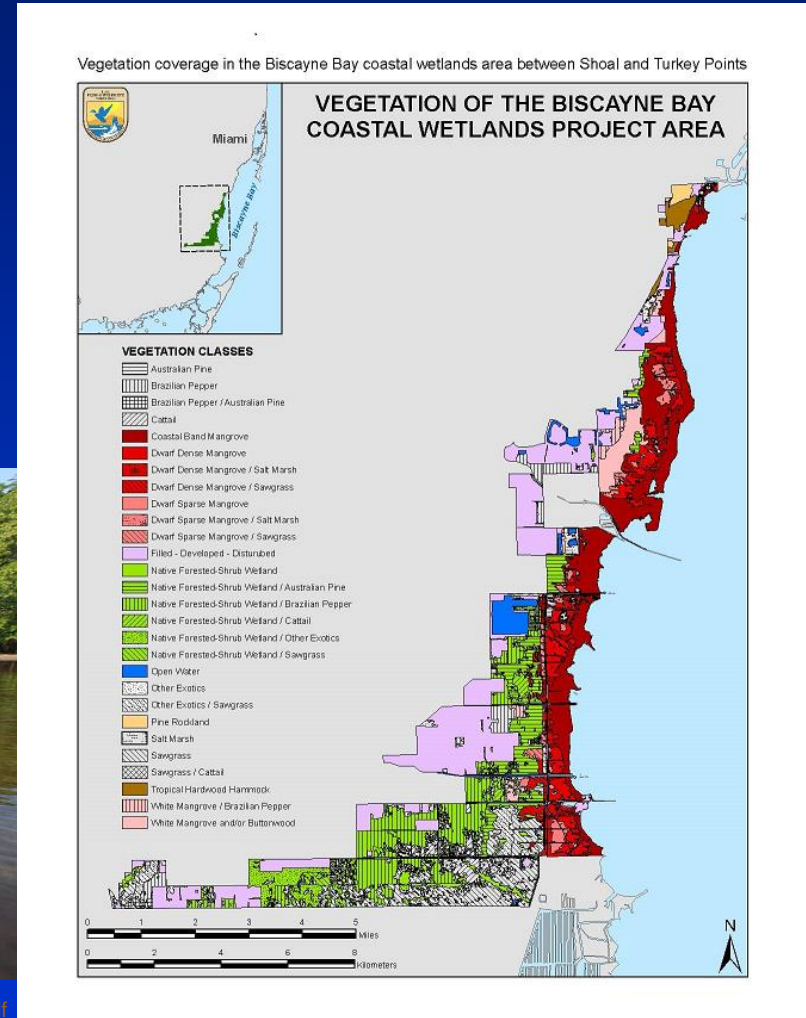
WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 3: IDENTIFY & DEFINE MANGROVE SHORELINE

Identify, and define (GIS) current and future projected red mangrove bounded shoreline in Biscayne Bay (adapt and expand current information)



MAP SOURCE: http://www.evergladesplan.org/pm/ssr_2009/ssr_figure_pdfs/fig_scs_veg_bbcw_map.pdf



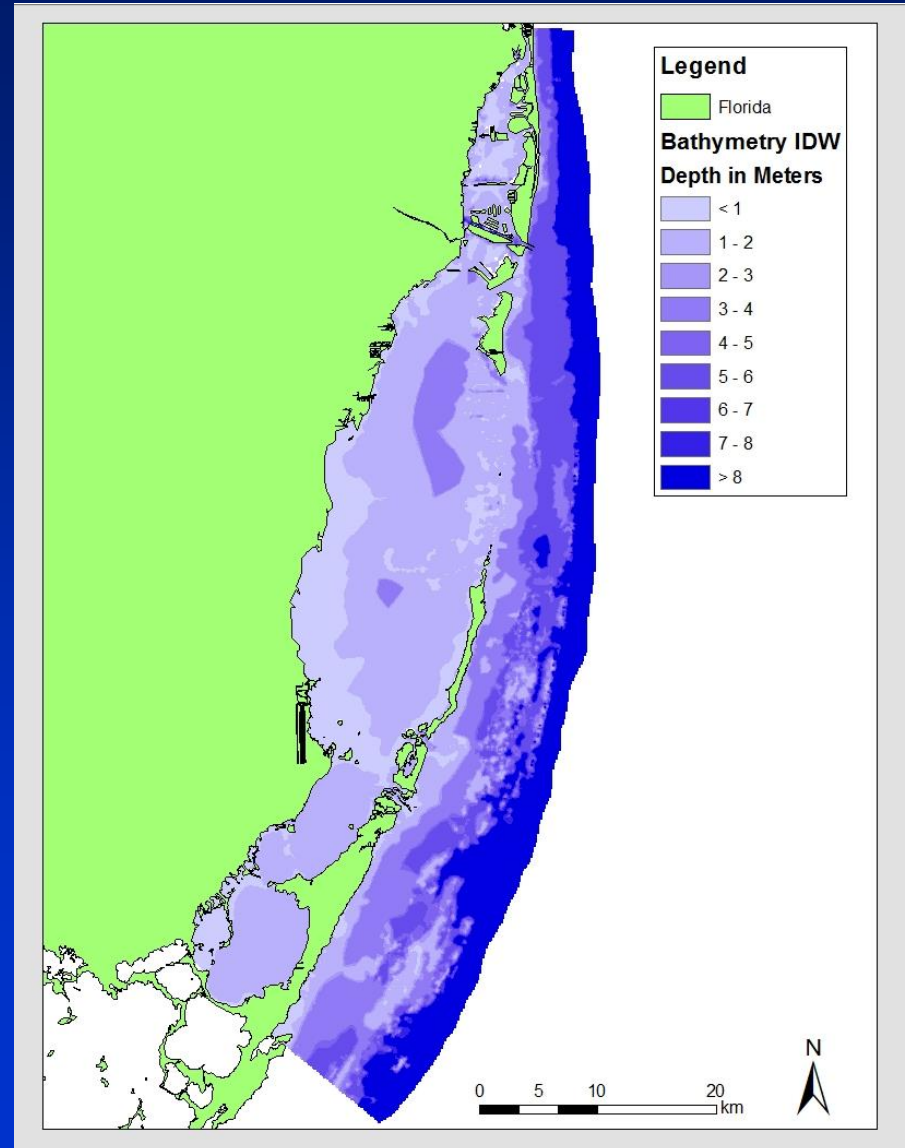
BISBAY BLUEPRINT GROUP:

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 4: IDENTIFY DEPTH ASSOCIATED WITH JUVENILE SAWFISH HABITAT (< 1m)

This was defined in the CHP as “*Shallow euryhaline habitats characterized by water depths between Mean High Water line (MHW) and 3 feet (0.9m) measured Mean Lower Low Water (MLLW)*”

The GIS map produced by David Bouck (RSMAS) shows the lightest blue areas as those >1m.



WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY?

(3) TASKS > Task 3

Compare TASKS 2, 3, and 4 to the defined “northeastern boundary limit” description of the defined “critical habitat area”.



WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY?



SOURCE: NOAA SAWFISH MANAGEMENT AND CONSERVATION

With this information it is very likely all requirements in the current "critical habitat designation area" will be identified, and verified as CONFLUENT with at a minimum extreme southern Biscayne Bay with the entire bay being "historic habitat" similar conditions in the past, current and future all supporting NOAA recovery goals

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY?

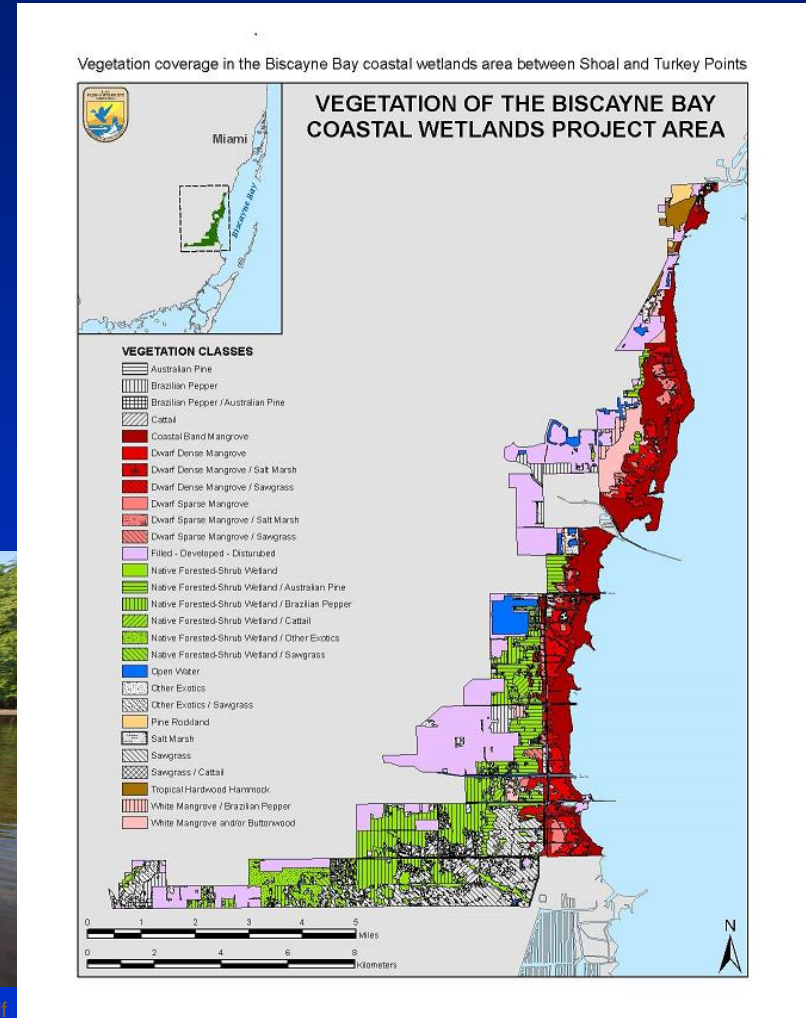
TASK 4 > AN ISSUE

In speaking with FFWC sawfish coordinator Greg Poulakis, I learned that “living shoreline” restoration using red mangroves was discussed as not fulfilling the “mangrove shoreline requirement”.

However- this seems contrary to a significant number of ESA plans for other species including many inshore and reef recreational and commercial species (?)



MAP SOURCE: http://www.evergladesplan.org/pm/ssr_2009/ssr_figure_pdfs/fig_scs_veg_bbcw_map.pdf



BISBAY BLUEPRINT GROUP:

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 5: DECIDE WHICH TYPE OF PROTECTION TO TARGET; PURSUE ESA OR HAPC?

Which is best fit and supported by evidence collected

- 1) Pursue ESA critical area boundary increase to include some part of BISBAY?**

- 2) Pursue HAPC (Habitat Area of Particular Concern) listing** URL: http://www.greateratlantic.fisheries.noaa.gov/hcd/sec_3.pdf

Smalltooth Sawfish ESA listed 2009

NEXT ESA REVIEW PERIOD 2019

NMFS designated critical habitat for smalltooth sawfish in September 2009 (74 FR 45353).

ESA LISTING PROCESS

- Petition or self initiation

- 90 day finding

 - (+) presents substantial information that listing be warranted

 - (-) does not present substantial information that listing may be warranted

- Status Review

- 12 month finding either;

 - “not warranted” = FONSI (Finding of No Significant Impact)

 - Proposed Rule

- Final determination

- Critical habitat Designation

ESA STATUS REVIEW PROCESS: (2009 (sep) / 2014 / TARGET DATE> 2019)

ESA listing are reviewed periodically every 5 years.

SOURCE: NOAA PRESENTATION “ESA Listing Updates: hammerhead & Dusky Sharks) 3/28/2014

http://www.nmfs.noaa.gov/sfa/hms/advisory_panels/hms_ap/meetings/april_2014/documents/esa_listing_updates_hms_advisory_panel_2014.pdf

BISBAY BLUEPRINT GROUP:

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 5: (CONT) WHAT IS AN HAPC?



Habitat Areas of Particular Concern (HAPC). are areas that provide important ecological functions and/or are especially vulnerable to degradation. HAPCs are discreet subsets of Essential Fish Habitat (EFH). They are considered high priority areas for conservation, management, or research because they are rare, sensitive, stressed by development, or important to ecosystem function. The HAPC designation does not necessarily mean additional protections or restrictions upon an area, but they help to prioritize and focus conservation efforts. Although these habitats are particularly important for healthy fish populations. HAPCs are decided by the regional fisheries management council.

These have been specified mostly for commercial fisheries species, salmon, scallops etc.

SOURCES:

http://www.westcoast.fisheries.noaa.gov/habitat/habitat_types/HAPC.html

http://safmc.net/Portals/6/Meetings/Council/BriefingBook/Mar2010/ECBM/Attach1B_EFH_HAPCs.pdf

Thanks to Tom Jamir NOAA for this suggestion!

BISBAY BLUEPRINT GROUP:

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 5: (CONT) HOW DOES ONE PROPOSE A HAPC?

HAPC proposals will be required to meet at least two of the four HAPC considerations (criteria) established in the EFH Final Rule: importance of ecological function, sensitivity, vulnerability, and rarity. Rarity will be a mandatory criterion of all HAPC proposals.

Four criteria are used to select candidate sites for EFH-HAPC designation:

1. Rarity of habitat (R)
2. Particularly susceptible to human induced degradation (S)
3. Especially ecologically important function provided by habitat (E)
4. Or located in an environmentally stressed area (ES)

(1,2,4 easy to document)

EX: HACP:

http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/HAPC/10_03HAPC.pdf

BISBAY BLUEPRINT GROUP:

WHAT WE NEED TO DO TO ASSIST RESTORATION OF SAWFISH STOCKS IN BISBAY? (5) TASKS

TASK 5: (CONT) HOW DOES ONE PROPOSE A HAPC?

Proposals for smalltooth sawfish for an EFH-HAPC designation also need:

Identification of the fisheries, sectors, stakeholders and communities to be affected by the establishment of the proposed HAPC (Who benefits from the proposal and who would it harm?) and any information you can provide on socioeconomic costs, including catch data from the proposed area over the last five years

Clear geographic delineation for proposed HAPC (example written latitude and longitude reference points and/or delineation on an appropriately scaled NOAA chart)

Provide best available information and sources of such information to support the objectives for the proposed HAPC. (Citations for common information or copies of uncommon information)

SOURCE: North Pacific Fishery Management Council;; HABITAT AREAS OF PARTICULAR CONCERN PROCESS (HAPC)
http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/HAPC/10_03HAPC.pdf

End presentation



Juvenile smalltoothed sawfish
photographed Whitewater Bay
2010 by Jason Staples

REFERENCED MATERIALS / PUBLICATIONS AS THEY APPEAR

PRESENTATION: George H. Burgess and Tobey H. Curtis. Temporal Reductions in the Distribution and Abundance of U.S. Atlantic Sawfishes (Pristis spp.) Florida Museum of Natural History University of Florida

FNHM GLOBAL SAWFISH ENCOUNTER DATABASE :

<http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishdatabase.html>

NOAA SMALLTOOTH RECOVERY PLAN (2009);

<http://www.nmfs.noaa.gov/pr/pdfs/recovery/smalltoothsawfish.pdf>

NOAA SERTC SMALLTOTH SAWFISH PAGE:

Shelley Norton - Sawfish Coordinator / Phone: (727) 824-5312 / shelley.norton@noaa.gov

http://sero.nmfs.noaa.gov/protected_resources/sawfish/index.html

HOW TO REPORT A SAWFISH SIGHTING:

<http://myfwc.com/research/saltwater/fish/sawfish/contact/>

To report a sawfish sighting:

-E-mail: Sawfish@MyFWC.com

-Telephone: 941-255-7403

Fields, Andrew T., Kevin A. Feldheim, Gregg R. Poulakis, and Demian D. Chapman. "Facultative parthenogenesis in a critically endangered wild vertebrate." *Current Biology* 25, no. 11 (2015): R446-R447.

Wildlife Conservation Society. "New listing to protect 21 species of sharks and rays." *ScienceDaily*. ScienceDaily, 10 November 2014. <www.sciencedaily.com/releases/2014/11/141110110209.htm>.

05/27/14 Rare Sawfish Caught In South Florida Looks Like Something From Prehistoric Times;

http://www.huffingtonpost.com/2014/05/27/rare-sawfish-boynton-beach-florida_n_5397193.html

REFERENCED MATERIALS / PUBLICATIONS (CONT.)

This Disaster On Twitter Is Why You Shouldn't Harass Endangered Animals

<https://www.thedodo.com/sawfish-twitter-illegal-angler-907608487.html>

MCCLATCHY NEWSPAPERS INTERVIEWS 12/30/2014

<http://www.watertowndailytimes.com/article/20141230/NATIONAL/141239971>

Norton, Shelley L., et al. "Designating critical habitat for juvenile endangered smalltooth sawfish in the United States." *Marine and Coastal Fisheries* 4.1 (2012): 473-480

Heupel, Michelle R., John K. Carlson, and Colin A. Simpfendorfer. "Shark nursery areas: concepts, definition, characterization and assumptions." *Marine Ecology Progress Series* 337 (2007): 287-297.

<http://researchonline.jcu.edu.au/2614/>

Comments included in the Designation of Critical Habitat for the Endangered U.S. Distinct Population Segment (DPS) of Guided Smalltooth Sawfish 6 actions from November 20th, 2008 to May 2009

NOAA PRESENTATION "ESA Listing Updates: Hammerhead & Dusky Sharks) 3/28/2014

http://www.nmfs.noaa.gov/sfa/hms/advisory_panels/hms_ap/meetings/april_2014/documents/esa_listing_updates_hms_advisory_panel_2014.pdf

HAPC (Habitat Area of Particular Concern) listing:

http://www.greateratlantic.fisheries.noaa.gov/hcd/sec_3.pdf

2010 HAPCs - South Atlantic Fishery Management Council

http://safmc.net/Portals/6/Meetings/Council/BriefingBook/Mar2010/ECBM/Attach1B_EFH_HAPCs.pdf

North Pacific Fishery Management Council.; HABITAT AREAS OF PARTICULAR CONCERN PROCESS (HAPC) http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/HAPC/10_03HAPC.pdf